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DISPLACEMENT OF MEN BY MACHINES

EFFECTS OF TECHNOLOGICAL CHANGE IN COMMERCIAL PRINTING

PREPARED UNDER THE AUSPICES OF THE
COLUMBIA UNIVERSITY COUNCIL FOR RESEARCH
IN THE SOCIAL SCIENCES

DISPLACEMENT OF MEN BY MACHINES

EFFECTS OF TECHNOLOGICAL CHANGE IN COMMERCIAL PRINTING

BY ELIZABETH FAULKNER BAKER

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NEW YORK: NINETEEN HUNDRED THIRTY THREE
COLUMBIA UNIVERSITY PRESS

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COLUMBIA UNIVERSITY PRESS

PUBLISHED 1933

PRINTED IN THE UNITED STATES OF AMERICA
FRANCIS EMORY FITCH, INCORPORATED

TO

AN ADJUSTMENT OF MACHINES TO MEN

AS ORDERLY AND BALANCED

AS THE TECHNIQUES

BY WHICH THE MACHINES ARE MADE

FOREWORD

So far as the writer knows, this publication is the first that deals both with changing technology and labor displacement in representative plants and with the subsequent economic history of the men displaced. Economic sailing is rough in these years. The catastrophe of men tossed overboard through displacement by machines has sharply commanded attention. "Technological unemployment" has come to the fore as a source of alarmed discussion. Long a news feature in newspapers and periodicals, startling and fascinating illustrations of displacement fill the air. Employers, wage earners, social-service workers, and students argue as to the proportions of the problem and disagree as to the means of dealing with it.

But with sober study, doubts and modifications of original conclusions have now arisen because the phenomenon called "technological unemployment" has proved elusive and baffling when attempts are made to examine its nature and to measure it. The first contributions of research workers were in the form of general analysis. Valuable as these were as a beginning, more specific knowledge of what is actually occurring in particular cases became essential if measures of control were to be discovered.

The printing industry with its clicking presses ranks high among those popularly grouped among the man-displacing trades. Partly because of this, the present study was centered on the commercial branch of printing where special alarm has been felt. The aim was to trace the economic and social fate of manual press-feeders displaced by mechanical feeders. But as the search proceeded the effects of machine installation became more obscure rather than less so. The needle was in the haystack but it was constantly slipping, and there was so much hay to clear away that the original quick procedure had to be redirected and the whole effort prolonged.

The conditions that changed and controlled the course of the investigation were twofold. First, the nature of the industry which, though highly mechanized, introduces new techniques only gradually into hundreds of small competitive pressrooms where labor turnover tends to be high and regularly employed men are transferred from job to job. The second was the absence of records. In the printing industry today, and probably in most other industries, there is no provision either by employers or by unions for recording current changes in techniques or in employment. Pay-roll records and union lists of men who have paid their dues are entirely inadequate for tracing the whys and wherefores of changes in employment and of separation from work. In general, the records pertinent to an inquiry of this kind were fragmentary and incomplete.

The present study, therefore, bears witness to the difficulties of looking in from the outside upon an industry in process of change. It was impossible, even had it been desirable, to follow any one method of analysis. With whatever discretion could be developed, several methods were used—statistical, descriptive and inferential. Although conclusions have been held strictly to the data, the reader has been informed where data were inadequate or fragmentary, and where tentative hypothesis was the only alternative.

The findings throughout this investigation have raised so clear a challenge to the phrase "technological unemployment" as an adequate designation of what is taking place that another word has been supplied. Revealing time and again that the phenomenon is as much cultural as technological, the phrase *technocultural unemployment* spontaneously emerged as the analysis was pushed to its close. The concept which this term conveys seems to crystallize what was found in the printing industry.

One of the moot phases of the controversy over the labor-saving effects of machines is whether the number of men engaged in designing and making the machines and in distributing their multiplied products does not at least balance the number which the machines have displaced, leaving no net loss in the labor market. Important as this point is for full treatment of the subject, the present inquiry demanded limited scope. Nor could effects of pressroom mechanization upon the supplying and consuming industries be considered. So we have found it necessary to omit from the study the effects of technical change in the contiguous composing room and bindery, as well as in the manufacture of pressroom machinery, paper and ink and among such large consumers of printing as the great mail-order houses whose sales have been incalculably stimulated by the progress in printing.

Because this has been an investigation that required pioneering, and because the process is more understandable if accompanied by some technical explanation, the methods adopted in the study and the most important difficulties encountered are presented rather fully. In order to free the text from complications these methods and difficulties are set down in appendices where collated raw data are also presented in a series of twenty-three tables. Effort has been made to insure complete accuracy in the collection and use of material. In order to avoid important errors in data or interpretation, many persons connected with the manufacture of pressroom machinery and with the processes of printing have been consulted. In a work of this size, however, it is probably too much to hope that no errors of detail will be discovered.

No attempt was made to bring the main body of information further than the winter of 1929 because inclusion of changes during the depression would have blurred the cumulative picture for the period since 1912. Some indication of the impact of the depression and of its far-reaching implications has been attempted separately in Chapter VIII and at the end of Chapter IX. These chapters together with I and IV present the more human and less technical parts of the monograph. Chapter II is necessary to an understanding of the nature of the new machines. Chapter III condenses the findings of the five-year survey, describes the duties of pressroom workers, and attempts to measure changes in their productivity. Chapters VI and VII, as well as VIII and IX may supply material for those especially interested in industrial relations. Chapter V is a more technical discussion of New York and Chicago as printing centers, and of available evidence of the interaction of technological change and organized, as compared with unorganized, labor. Some of the material in Chapters II, III and IV, including the charts, and a large part of Chapter V were originally published in the *American Economic Review* for September, 1930 and December, 1932.

Many persons including friends and colleagues have contributed in varying degree and with memorable patience to the making of this study. The Columbia University Council for Research in the Social Sciences supplied the research fund without which the work could not have been attempted. Professors Robert E. Chaddock, Paul F. Brissenden and Frederick C. Croxton, as advisory committee for the Council, gave most generously of their time and advice and read the manuscript. To the manufacturers of presses and of mechanical feeders and to employing printers, I am indebted for unstinted contributions of confidential material which, of course, could be presented only in summaries. In some cases this gift entailed weeks of work by employees of these firms which, if paid for out of the research fund, would have greatly reduced the budget available for the rest of the investigation. These contributors, with the exception of the three employing printers in and near Chicago whose identity unfortunately cannot be divulged without danger of violating a pledge that has been given by the author, are listed in Exhibits 3, 4 and 5 of the Appendix.

I was very fortunate in having the personal interest of important officials in employer and labor organizations. I wish particularly to mention F. A. Silcox and Donald H. Taylor of the Printers' League Section of the New York Employing Printers' Association, as well as John Clyde Oswald, managing director of this association, and Harry G. Cantrell, secretary of the Franklin Association of Chicago. These men read and commented upon the manuscript. The aid given by union representatives of the International Printing Pressmen and Assistants' Union of North America, New York Printing Pressmen's Union No. 51, and New York Printing Press Assistants' Union No. 23 is also greatly appreciated. With special warmth I thank John E. Donnelly, executive member of Pressmen's Union No. 51 who, with admirable ability gathered the data for the survey of New York pressrooms. The expert counsel of C. A. Hokinson in helping with the design of the more technical part of the inquiry and in giving general advice during the earlier stages of its prosecution are gratefully acknowledged, as are the courtesy and skilled service of the firm of Merwin-Davis in preparing the charts for plate-making. To Elinor Sachs Barr, a most intelligent assistant early in the investigation, to Nan Kelsey who ably copied the manuscript, to Frances Moore for reliable help in the proofreading, and especially to Alice B. Evans for her expertness in tabulating the data and in making the computations many thanks are due. Without Miss Evans as a faithful aide and associate during the four years of interrupted work it is difficult to think of myself as author of this monograph.

E. F. B.

BARNARD COLLEGE, COLUMBIA UNIVERSITY
December 1, 1932

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PART ONE

TECHNICAL PROGRESS AND ITS EFFECTS UPON THE WORKERS

Chapter I

INTRODUCTION

THE PROBLEM AND THE INDUSTRY

For thirty years metal fingers have been gradually replacing human hands in the process of feeding sheets of paper into the commercial printing press. And rather less gradually improved presses have been installed, saving other forms of labor. What has become of the manual feeders? How has the whole group of pressroom workers been affected by the coming of the new machines? Have the disappearing occupations left their men out of work? Has a labor reserve been accumulating?

1. "The Second Industrial Revolution" and "Technological Unemployment"

It is well to remember, of course, in framing questions of this kind, that the substitution of tools and machinery for men is as old as invention itself, and that invention is as old as man. Nevertheless, it now appears that the rapidity with which industry is absorbing inventions, and the accelerated pace at which production processes have been mechanized in recent years, develop new aspects in an old problem. We appear to have a fairly broad base for the current characterization of the resulting changes as a "second industrial revolution," in which the displacement of hand-labor by machines has become so quickened that new and deep concern over "technological unemployment" has arisen.

So far we have only limited knowledge of this phenomenon called "technological unemployment." We do not know whether it is as formidable as many fear that it is. If we grant, with the classical economists, that human wants are indefinitely expansive, it would seem impossible for the volume of unemployment to increase even though we greatly expand production through mechanization. Quite on the contrary, it would seem that our resulting enjoyment of more and more want-satisfying goods and services would only whet the appetite for still more satisfactions, giving ever more employment to workers. Even now the seriousness of unemployment in industry has given rise to the prophecy that, as the depression lifts, we shall develop the production of services—medical, educational, recreational, artistic—to a degree almost beyond anything we have dared to dream.

Moreover, caution is important lest the phrase "technological unemployment" become a catch-all for all types of joblessness. In the printing industry, for example, the out-of-work rooms for pressroom employees are never without their lists of waiting men whose plight may have little or nothing to do with the installation of new press machinery. The cause of their unemployment may be, instead, the all-too-common one of vocational maladjustment; it may be age, or general inefficiency. They may be jobless as a result of friction with a psychopathic foreman, seasonal depression, the business failure of the employing printer, or his departure from the city to set up his printing office elsewhere; or the merging of one firm with another. The cause of joblessness may be lack of ambition on the part of the worker to keep pace with progressive changes that take place in his plant; it may be lack of opportunity to learn the new processes. Finally, it may be that the rate of installing new machines is so rapid (or so slow) that this particular worker, and that one, and another are rendered unnecessary to the plant and, perhaps, even to the industry. Instances have been reported in which whole groups of persons have been thrown out of work in this way.[1] For these workers, then, the machine has broken the continuity of employment and they must seek a livelihood elsewhere.

There is little doubt that technical progress is a cause of unemployment—perhaps even a greater cause in the past than we have realized. Technical progress in industry, with which we are here concerned, promotes mechanization. Mechanization of industry seems properly to consist not only of improved mechanical equipment that saves human labor, but of all the technological changes which emerge from, or accompany, these improvements; it epitomizes all that we mean by the process of

[1] Citations are given on p. 7, below.

reducing unit costs of production through improved methods and wider markets for the products. Without conscious planning to prevent them, therefore, instances are bound to occur simultaneously where an advance in mechanization and in the resulting volume of production proves to be too rapid to be accompanied by smooth adjustments in employment and in consumption. This causes workers here and there to be thrown out of their occupational niches with unequal chances of finding new ones in which they can earn a living. Some find new jobs immediately; others, possibly an increasing number, suffer enforced idleness for months.

2. The Mechanization of Printing

The printing industry makes use of more machinery than may be realized at first thought. In fact, composing room, pressroom, and bindery have all been transformed mechanically within the past fifty years. The 1880's brought the linotype and monotype to the compositors, new presses and techniques for making the half-tone plate to the pressmen, and to the bindery, automatic processes for folding, gathering and covering books and magazines.

It took about twenty years for the linotype and its mechanical associates practically to supplant straight-matter typesetting by hand. The story of the adjustments that were made for the men by the International Typographical Union in agreement with the employing printers assures us that relatively few men were dislodged—that, instead, hand-compositors were taught the new processes and were transferred to the new machines.[2] And although one man at a linotype came to achieve about as much as four men had done by hand, the widening use of printing kept the larger proportion of compositors at work. Composition by monotype and preparation of the form by photographic processes which largely eliminate type composition may prove to have other important effects upon employment in the composing room. As yet, the placing and designing of the layout of equipment probably constitute the greatest changes in this department since the general adoption of mechanical typesetting.

[2] Barnett, G. E., *Machinery and Labor*, chap. i.

Pressrooms and binderies in commercial printing plants have been taking their more leisurely, although none the less complete, turns at mechanization. The bindery girl of today is worth three of her predecessors as she tends the multiform machine that folds, binds, trims and conveys the book in one continuous process. The scenes in the bindery continue to change as we shall see that they do in the pressroom, and today the employment of hundreds of workers is affected. The public hears less from the bindery than from the pressroom employees, perhaps on account of the nature of the work and of the workers. Bindery employees are largely girls whose industrial lives, so far as their entrances and exits into workrooms are concerned, tend to be more fluid than those of male pressroom workers. The higher turnover of bindery personnel makes adjustments to changing processes less difficult and more silent than where changes affect strongly organized and long-apprenticed men who think of themselves as engaged in a life work.[3]

Printing and publishing forms one of the major industries in this country, according to the United States Census of Manufactures. Since 1920 it has employed one in every thirty-three of all manufacturing wage earners. In 1929 it paid one-twentieth of all manufacturing wages. A dozen years ago the value of paper and printing that was added by manufacture exceeded the corresponding value of any other industry, while printing and publishing alone stood third highest. Even after the greatly increased production of iron and steel products, machinery, foods, and textiles, paper and printing in 1929 stood fifth from the top in its value added by manufacture. Printing and publishing stood seventh from the highest.

Within the realm of printing and publishing, the production of "book and job" or "commercial" printing occupies an important place—in fact, the largest place of any single branch of the industry.[4] Although newspapers seem to be everywhere, the more varied products of the commercial printer are equally widespread, comprising as they do our books and periodicals, our five-pound mail-order catalogues and telephone books, our job printing for business and trade uses, our tags, labels, menus, tickets and stationery, our special-sale announcements of all those goods that tempt the consumer, from fresh country eggs to sables.

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[3] The displacement of men by the lining machine in the book bindery is not to be overlooked, however.

[4] The United States Census of Manufactures shows that in 1927 book and job printing was 57.7 per cent of the value of all printing while newspapers composed 42 per cent; 62 per cent of all wage earners employed in printing and 51 per cent of all wages paid were in the book and job branch of the industry.

It is with the mechanization of the commercial[5] printing pressroom that the following pages will be concerned,[6] in an attempt to answer those questions with which we began. What have the automatic-feeding machines and the labor-saving presses done to the pressroom workers? What has become of the manual feeders? Are these workers to be found with the outmoded subway ticket choppers, telephone operators, musicians, makers of rubber shoes, cutters of men's clothing, and all the others upon whom, we are told,[7] technological obsolescence has forced unemployment and vocational readjustment? The unknown human story in printing which must be common to all advancing mechanization could be told, were it possible to trace minutely the changing scenes from the Washington hand press of the thirties, on which a man turned out a few hundred impressions a day, to the great magazine-rotary press of today

[5] In addition to newspapers, book and job printing as reported in the United States Census excludes music and all publishing conducted as a separate enterprise. Outside its scope also is practically all book-binding, blank-book making, wood, steel and copper engraving, photoengraving, stereotyping, electrotyping and lithographing. While the reports of the census include publishing companies by whom no printing is done, they omit periodical printing when produced in plants which print newspapers as well. In these two ways the census classification differs from that part of the industry whose technological changes are discussed in the following pages. It is impossible to state accurately to what extent these two differences would tend to cancel each other were the respective figures available.

[6] Bulletin no. 475 of the United States Bureau of Labor Statistics presents an account of the mechanization of newspaper printing and the resulting increase in the productivity of labor, prepared by Mr. S. Kjaer.

[7] R. J. Meyers, "Occupational Readjustment of Displaced Skilled Workmen," *Journal of Political Economy*, August, 1929; Isador Lubin, "The Absorption of the Unemployed by American Industry;" Ewan Clague and W. J. Couper, "The Readjustment of Workers Displaced by Plant Shutdowns," *Quarterly Journal of Economics*, February, 1931. United States Bureau of Labor Statistics, *Monthly Labor Review*, Series of articles on effects of technological changes upon employment in the amusement industry, August, 1931; in agriculture, October, 1931; in motion picture theaters, November, 1931; in the cigar industry, December, 1931; in the motor vehicle industry, February, 1932; in telegraph offices, March, April and May, 1932; (and continued).

which disgorges four or five hundred feet of printed matter per minute. Could these scenes be reënacted for study, we should see decades of interruptions in the work of employees, their ultimate reabsorption perhaps by the new processes, their ever-increasing numbers as industry has expanded. The present investigation could not go back so far as this, nor be anything like so inclusive. What has been attempted, however, is to trace the exact nature of the mechanization process, to see how the workers in their collective action have responded to displacement, and to single out representative pressrooms for close observation in order to see how some workers actually fared.

CHAPTER II

THE NEW MACHINES[1] AND THEIR COUNTRY-WIDE ADOPTION

The equipment used in commercial printing is both varied and complex. What else could be expected, when production ranges from a handful of business cards or dance menus, to a two-million-edition magazine embellished by dozens of four-color illustrations? Press equipment consequently grades from the smallest 8″ x 12″ hand-fed platen or job-press which turns out six or eight hundred impressions an hour to the great rotary-web press which prints, folds, stitches and covers three or four thousand books of from 32 to 128 pages an hour. The process varies also in size of type and sheet, in length of run, in quality of printing, paper and ink, in the number of colors and the number of half-tones used.

The nature of commercial printing explains the wide range in the size of the plants. The federal census reported between twelve and thirteen thousand establishments for 1929, but this count excludes a large number because it omits those shops in which the value of annual products falls below $5,000. As a matter of fact, unknown hundreds of printing offices are "one-man" or "bedroom" shops such as a man who has learned to handle a job-press sets up in his cramped living quarters to bid for neighborhood patronage. Benjamin Franklin himself graduated from a small printing office. At the other extreme are the great printing factories that employ a thousand or more workers in a maze of clicking machines. In New York City in 1922, 60 per cent of the 1,357 print shops in Manhattan below 59th Street were one- and two-man shops. Only 48 firms employed as many as 100 workers, while one employed 1,000 or more.[2]

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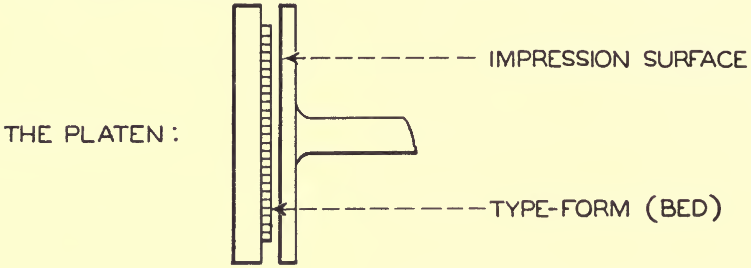
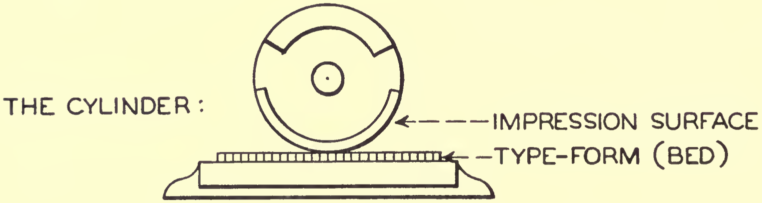
[1] "The Chronological Record of the Introduction of Modern Commercial Printing Machines" is presented in Exhibit 1, Appendix B, p. 229.

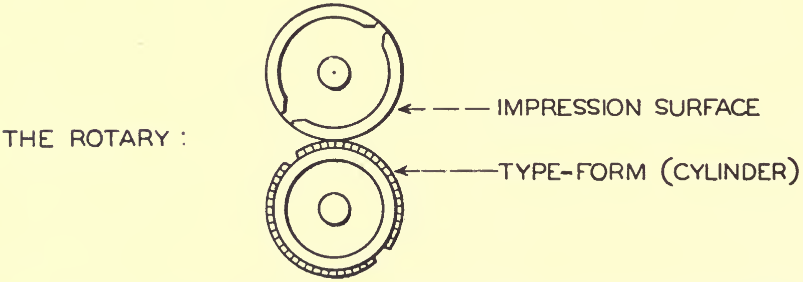
[2] Hindricks, A. F., *The Printing Industry in New York and Its Environs, Regional Plan of New York and Its Environs.* "Economic Series." Monograph no. 6, pp. 48–53.

1. Printing Presses in Use Today[3]

As onlookers at the mechanizing process in the commercial printing pressroom, we must first have simple knowledge of the equipment used. Reduced to their elements, there are three kinds of presses that do our printing today. The drawings help to show how different they are:







Slightly less simple but much more exact for our purposes are these enlarged press-groupings:

(*a*) Platen presses (all sizes, from 8″ x 12″ to 14″ x 22″)
(*b*) Flat-bed cylinder presses
    (1) Job-automatic single-cylinders (sizes from 13″ x 20″ to 17″ x 22″)
    (2) Small single-cylinders (sizes over 22″ and including 42″)

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[3] Exhibits 2–4, Appendix B, pp. 230–32, show the trade names of the presses and their respective manufacturers.

    - (3) Large single-cylinders (sizes over 42″)
    - (4) Two-color and perfecting double-cylinders (sizes from 40″ x 53″ to 52″ x 70″)[4]
- (c) Magazine-rotary presses[5]
    - (1) Web-fed rotaries[6] (usually made to order)
    - (2) Sheet-fed rotaries (usually made to order)

Platen Presses

Platen presses occupy a distinctive position in commercial printing. Their mechanical ancestors of the fifteenth century yielded the first pages printed from movable type. Modern platen presses, the simplest and least expensive of present-day equipment, have been on the market some seventy years. They have been fashioned by the thousands. Their small size enables a neighborhood printer to install one in his own living quarters, and the space they occupy in a printing office is almost negligible. They run at good speed on superior half-tone and color work, as well as in everyday printing. They are easy to keep clean, to make ready, and to operate. Both the type-bed and the surface which receives the impression are flat; mechanical power brings the two surfaces together, and the sheet is printed in a single stroke.

Ford cars of the printing world, these little presses are sold, not by exclusive dealers, but by every printers' supply office in the country. Although they must now be classified as old models, sometimes even as "accommodation presses," many are automatically fed and are being constantly improved, so that the demand for them remains very wide. Platen presses produce most of the small cards, programs, menus, tags, letterheads, and circulars ordered in limited quantities.

Cylinder Presses

The greater weight of the cylinder press together with the continuous movement of the form-bed effects better ink distribution and more accurate register than is usually secured on the platens. The sheet surface which is exposed to the type-form for printing is cylindrical instead of flat. Moreover, it receives the impression, not instantaneously, as in the platen, but by being revolved over and with the reciprocating flat type-bed. This bed, horizontal in position, passes under the revolving cylinder to give the impression. The printed sheet then travels along to the delivery table at the end of the press. At the same time the cylinder, slightly elevated, revolves back to receive the next sheet and the flat-bed withdraws in the opposite direction for another distribution of ink. The cylinder makes two revolutions to every single forward and reverse movement of the bed.

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[4] Two-color presses in the small-cylinder group have been put on the market since 1928, the last year for which press sales were collected for this study.

[5] Rotary-offset presses bid fair to become regularly a part of commercial printing equipment, but so far they are used largely by lithographers and therefore need not be included in these groupings.

[6] Here, instead of sheets, a roll of paper like a great bolt of ribbon feeds continuously into the press.

During the half century of modern printing, *large cylinders*,[7] as they are designated in these pages, which are classified with platens as old models, have been the more dignified mechanisms of the commercial pressroom. As platen presses have turned out the small work, the cylinders have printed the larger sheets and filled the larger orders. A visit to a commercial pressroom today may be rewarded by the sight of these presses turning out printed sheets of paper more than five feet in width and nearly as long. Large orders for small sheets of printing can be filled much more quickly than on platen presses by printing the same copy several times "up" on one sheet, afterwards separating it by automatically cutting into smaller units.

Since 1913, the newer models among the cylinder presses have appeared rapidly upon the printing scene—the "job-automatics," the small automatic cylinders or "units," and the two-color cylinders and perfectors.

Job-automatic cylinder presses appeared on the market in the first year of the World War. They have made a spectacular sally upon the pressroom, crowding back platens on the one hand, because they are almost again as fast, and the large cylinders on the other, because they are faster, cheaper, and simpler to operate and maintain. These little presses are not spoken of as cylinders even though they operate on the cylinder principle. They stand by themselves, really, and are called "job-automatics" among printers. In addition to their high running speed, they feed the

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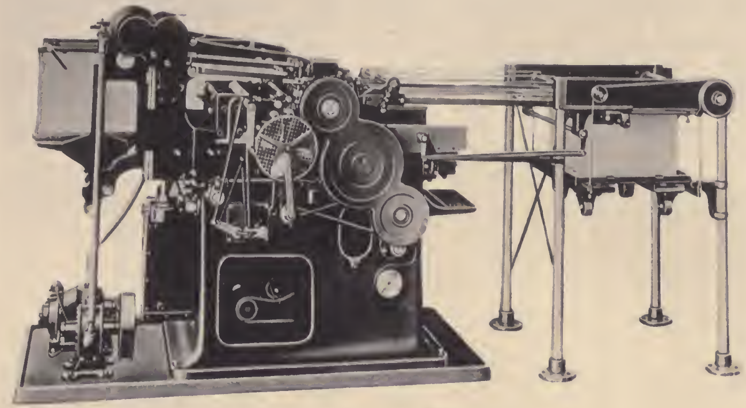
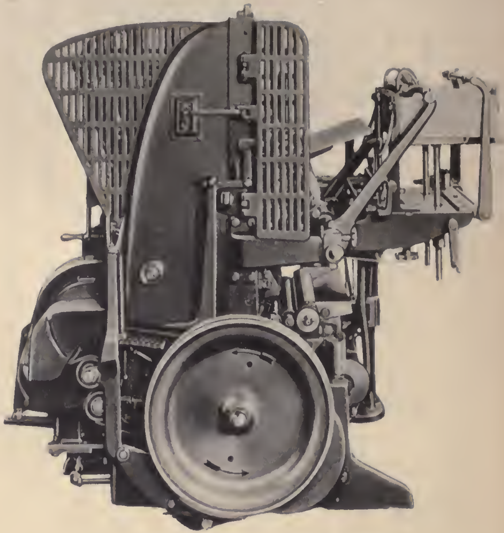
[7] Photographs of large cylinder presses with feeding attachments are shown opposite pp. 32 and 120.



JOB-AUTOMATIC CYLINDER PRESS SHOWING THE SELF-FEEDING MECHANISM ON THE LEFT AND THE AUTOMATIC-DELIVERY ATTACHMENT ON THE RIGHT



JOB-AUTOMATIC CYLINDER PRESS SHOWING THE SELF-FEEDING MECHANISM ON THE RIGHT

sheets into printing position by their own mechanism—a process which not only saves the labor of hand-feeding but eliminates those adjustments that automatic feeding attachments require in order to keep the tempo of feeding synchronous with the movement of the press. The simplicity of job-automatics together with their improved ink distribution and impressional strength reduces to a minimum the time for "making ready" and for the "wash-up," and this in turn saves time between printing jobs, making it possible for one order to follow quickly upon another.

Job-automatics are favored by the larger printing offices and are of course a boon to the more prosperous neighborhood printers who install them along with, or instead of, the platens. To the moderate-size printing office one week may bring some two hundred separate orders ranging from thirty to twenty thousand impressions. Even for the largest of such orders which have customarily been printed on the large-cylinder presses, it is frequently desirable now to set the small presses to work—the job-automatics or the new small cylinders.[8]

The new *small-cylinder presses*, or "units," which have come upon the market even more recently than the job-automatics, are built on the same plan, with a little larger bed-size. These presses are frequently called "units" in the trade because, like the job-automatics, their feeding mechanisms are integral parts of the presses. Although this size-group includes a few old models, it is largely composed of high-speed, automatically-fed machines which also threaten the existence of the older large cylinders.

Two-color and *perfecting-cylinder presses* are not especially new—they are some twenty years old—but they should be classed with the new labor-saving models because of their greater productivity. By the use of a transfer cylinder they accomplish two processes in one. The two-color press requires but one run of the sheet to print two colors on one side, whereas the ordinary single cylinder requires two. The perfecting press prints both sides of the sheet in one running, while the single cylinder prints but one side in each running.

The high price of these presses has retarded their adoption

[8] The practice in this regard is discussed briefly below, p. 49.

except where there is enough color printing to keep them busy most of the time. This steadiness of custom comes largely from those periodicals whose runs are not long enough nor the patronage secure enough to warrant the still greater investment in rotary presses. Consequently, the smaller establishments, to which these medium-long-run orders rarely come, have not installed color-presses so much as they have used their single cylinders, both large and small, for what color work they do.

In spite of the expense of installation however, color and perfecting presses have become more and more popular among printers in a world that clamors for color and speed. So much so that the last three years have brought to the market a new school of small two-color unit presses to vie for a place not only against the semi-obsolescent cylinders but also against the new automatic cylinders.

Rotary Presses

Rotary presses are the giants of the pressroom, turning out the more widely-circulated periodicals as well as the large newspapers of the country. They are cylinder presses in that they print on a cylindrical surface, but for them the type forms also, by stereotyping, are curved around an opposing cylinder. The resulting continuous motion enables these huge and highly complex machines to print hundreds and thousands of square feet of paper a minute. The fastest of these are web-rotaries which are automatically fed from a roll of paper instead of in single sheets. Magazine-web-rotaries are often equipped to perform many of the functions of the bindery such as folding, stitching and pasting covers on the freshly-printed and cut sheets. On the one hand they save an enormous amount of labor; on the other, they have increased beyond measure the volume of printing which can be sold. Thanks to the rotary presses, some of which print four colors at once, two million magazines or mail-order catalogues are now printed with no more difficulty than were three or four thousand a quarter of a century ago.

The high degree of concentration of printing that these presses represent, requiring as they do an investment of from $30,000 to $100,000 each, has resulted in their mobilization in a small number of large establishments. Indeed, their performance is on so different a scale from that of the platen and cylinder presses that the United States Bureau of the Census classifies periodical printing with newspapers rather than with book and job printing where it is customarily grouped by the trade. Thus, there is reason as well as necessity[9] in dealing in the present study less fully with rotary presses than with all the other equipment more commonly used in commercial printing.

This rapid review of commercial printing presses should not close without mention of the rotary-offset press, which is not included in the reports of installation in this study because it has for the most part been installed in lithographers' rather than in commercial printers' shops. Broadly speaking, offset printing involves a photographic process which lessens the need of typesetting. Presswork is also saved because the need for make-ready is practically eliminated. Offset presses have been so developed in the past few years that they can print as many as four colors at a time. To the tutored eye their work is somewhat flatter than that printed from type-cast forms, and, for other reasons that need not be given here, their future in commercial printing is uncertain. Nevertheless, for the past several years they have been finding their way into commercial pressrooms, and in so far as they replace commercial printing equipment now in use they materially increase the production per man.

2. New Methods of Press-Feeding[10]

In addition to the labor-saving presses which have just been described, there has been a simultaneous equipment of the older machines with automatic feeding attachments. In fact, the automatic feeders appeared fifteen years before the job-automatics.

The puzzling recency of automatic feeding, however, and the persistence of hand-feeding, is revealed by the fact that even up to the year 1913 less than four per cent of more than sixty thousand platen and cylinder presses used in commercial printing were machine-fed. This was some thirty years after the beginning of modern printing, and fourteen years after automatic feeders appeared on the market. Since January, 1913, the adoption of the automatic-feeding attachment and of the self-feeding job and small-cylinder presses has been so rapid that, by 1929, 44,000 out of a total of 64,000 presses sold were automatically fed. This means that on two-thirds of all presses installed during the sixteen years up to 1929 (not including rotaries), the old feed-board with its attendant hand-feeder had given way to the modern process.[11]

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[9] The explanation for this necessity is presented in the Note for Exhibit 2, Appendix B, p. 230.

[10] In Exhibit 4, Appendix B, p. 232, the trade names of feeding attachments and their respective manufacturers are shown.

Until the turn of the present century every press claimed its human feeder as a part of itself. Standing at the feed-board at the back of the press, the feeder pushed, one by one, some 8,000 sheets of paper a day into the maw of the press. By one of two or three methods, he skillfully separated the topmost sheet from the pile on the board, and passed it along to the metal "guides." From the guides it was carried by motor power around and over the type-form to receive the impression, then delivered in a printed pile to the board at the foot of the machine.[12]

The mechanical feeder, in dextrous maneuver, imitates the motions of the manual feeder whom it displaces. The topmost sheet of paper must now be mechanically separated from the pile and moved along to the guides of the press for printing. This is accomplished in one of two ways:[13] by the "continuous" feeder which mechanically combs the top sheet, causing a number of sheets to be fanned out one beyond the other in easy position to be fed into the press; or by the "pile" feeder that makes use of suction fingers which, when dropped to the surface of the pile, lift the top sheet and slightly suspend it in air. From this position the sheet is quickly passed along to the guides of the press. The automatic feeder accelerates the speed of printing some 20 per cent—to 1,200 or 1,300 impressions per hour as compared with some 1,000 by hand. The extremely repetitious character of the

[11] With the relatively slight qualifications that some of the feeding attachments sold after 1913 (mechanisms quite separate from the presses) equipped presses installed prior to 1913, or replaced old feeders.

[12] With the platen press the feeder must extract the printed sheet with his left hand while he inserts with the right hand a sheet to be printed. The cylinder press delivers the printed sheet mechanically.

[13] These two processes will be explained further on pp. 33 and 119-20, below.

process, together with the need for precision, seems to invite the machine to replace the man.

Automatic feeding has both altered the nature of, and increased the demand for, commercial printing. The gaily-colored pages that meet the eye today are largely born of this process. The perfect register required for color printing, where from two to eighteen impressions are imposed one upon the other, often makes the process too exacting to be done well at high speed by hand. As for increased demand, the greater speed of printing at relatively lower cost, owing both to improved press and to automatic feeder, has deepened as well as widened the market for printed matter, such as door-to-door handbills, blotters, personal letterheads, and more and more books and magazines. Inexorably has the highly competitive commercial printer been obliged to pass on to his customers in the form of lower prices much of the advantage gained by the use of the automatic feeder and the new presses. But, as we shall see, these lower prices seem just as directly to have stimulated more orders for printing.

3. Country-wide Installation of Modern Equipment

The manufacturers of printing presses and feeding machines can tell us best about the extent of their adoption by printers. These companies[14] submitted sales' figures for what may be called the two eras of modern printing. Interestingly enough, both of these eras have been punctuated by events of a revolutionizing character. The first extended from the beginning in the early 1880's to 1913, the year before the World War; the second from 1913 to 1929, the year before the world depression. A glance at Table I reveals two noteworthy facts about machine installation: First, the printers of the country are installing presses much more rapidly nowadays than they did before the war—4,018 annually up to 1929 as compared with 1,916 before 1913; second, the older presses are giving way to the new. While four per cent more presses were sold in the recent 16 years than in the previous 32, sales of platens dropped 17 per cent and cylinders rose only

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[14] With one exception among the rotary-press manufacturers as inidcated in the Note to Exhibit 2, Appendix B, p. 230. Also Note 1, Appendix C, p. 257, explains the problem of collecting these data.

1.2 per cent except when the new job-automatics are included which brings their increase up to nearly 100 per cent.

TABLE I

SALES OF COMMERCIAL PRINTING PRESSES IN THE UNITED STATES[a]

Date and Press Group	Number	Per Cent Change post-1913 over pre-1913	Length of Sales Period in Years	Average Sales per Year
Prior to 1913				
All presses	61,326	——	32	1,916
Platens	49,607	——	27	1,837
Cylinders . . . . (small, large, two-color and perfecting)	11,719	——	32	366
1913-1929				
All presses	64,288	+ 4.1	16	4,018
Platens	41,292	−16.7	16	2,580
Cylinders . . . . (including job automatics)	22,996	+96.2	16	1,437
(excluding job automatics)	11,863	+ 1.2	16	741

[a] Rotary presses are omitted. All platen and cylinder presses sold since modern printing began after 1880 are included with the exception of a few odd styles of platens now long off the market. Their omission is unimportant in this study. The complete lists of machine sales for the years 1913–1928 are presented in Tables 1-4, Appendix A, pp. 201-4. In connection with this table the reader may care to turn to p. 23 below for the discussion of the relation of press installations to the renewal of presses.

Chart I[15] shows that these job-automatic cylinders which did not exist in 1913 compose more than one-sixth of all presses sold since that time. Moreover, the meteoric rise of these fast self-feeding presses marked the ascent of one model alone until 1922 when it was joined by two others.

The speed presses or "units" in the small-cylinder group are so much more recent that the full force of their introduction was being felt only when the depression began. The increasing popularity of the labor-saving two-color and perfecting presses, in spite of their high price, brought small two-color models into use, but these are so new that they are not included in our statistical pictures. They are indicative of the continuous and uncompleted changes that the pressroom is undergoing today.

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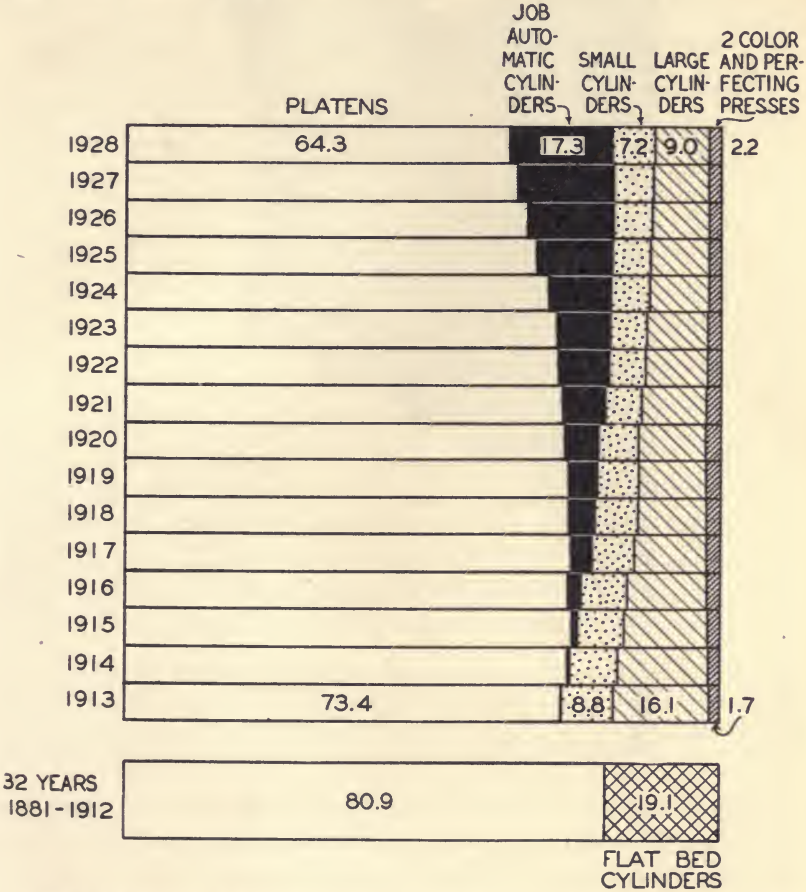
[15] The full table of yearly sales of presses in the United States is shown in Table 1, Appendix A, p. 201.

CHART I

The Percentage of Each Press Group of the Total of Platens and Flat-Bed Cylinders Sold in the United States, Cumulatively by Years, 1913-1928

Pre-1913 data are not included in these percentages; sales records of machines by years prior to 1913 were not available.



The advance of automatic feeding is even more striking than that of the new presses. Chart II[16] shows that while printers took little notice of the mechanical feeder before the war, hand-feeding 96 per cent of their presses, by 1929 two-thirds of all presses were machine-fed.

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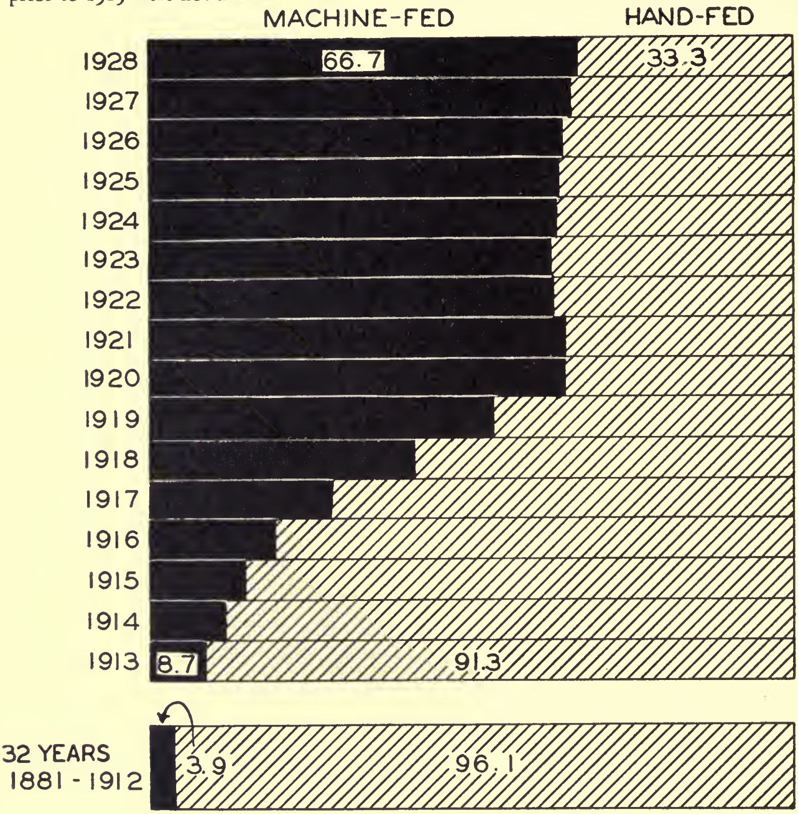
[16] Full summaries of sales records of automatic feeders are presented in Appendix A, Table 4.

CHART II

Percentages of Presses Which Were Hand-Fed and Machine-Fed Sold in the United States, Cumulatively by Years, 1913-1928

Pre-1913 data are not included in these percentages; sales records of machines by years prior to 1913 were not available.



The one-third hand-feeding that remains is done largely for two reasons: First, although platens and large cylinder presses are still numerically important, especially the platens that comprise nearly two-thirds of all presses in use and that are being augmented by new models, these two groups, as we shall see, tend to be used less than the new presses. In some pressrooms they stand idle a good deal of the time, being used only for emergency or short-run work which does not invite investment in the automatic attachments. Printers disagree as to how long a run must be to warrant setting the automatic feeder. Probably 2,500 to 3,000 impressions is a conservative minimum estimate for the pile-attachment, but usually more than this when the continuous feeder is used. Both of these attachments require extra floor space and height, the continuous more than the pile, another fact that sometimes militates against their installation. These feeders are shown attached to their presses in the photographs presented below.

A second explanation of the persistence of hand-feeding is that some materials that have to pass through printing presses remain more satisfactorily fed in this way, such as cardboard posters or very thin paper which is more than usually sensitive to atmospheric conditions.[17]

Interestingly enough, this semi-reserve of hand-fed presses was found to be matched by a reserve of hand-feeders when the union out-of-work rooms were visited in 1928. Here men waited for telephone calls from printers as is their custom. A study of the records of these calls showed that a large proportion of calls were for temporary hand-feeders whose work was more often for one day, or one night, or two or three, after which the feeder's name reappeared at the bottom of the union's waiting list.

During the World War these labor reserves had almost disappeared, and hand-feeding slumped as shown in Chart III. During those years platens and large cylinders were harnessed with automatic attachments as never before or since. For the market was agape for speed equipment. A platen that fed itself appeared; also the first satisfactory job-automatic cylinder, the popularity of which was instantaneous. Together, mechanically-equipped presses and the new speed models advanced into 1920. Then came general industrial depression with its plethora of labor and a tendency to revert to hand-feeding on the older machines. The new school of small self-feeding models continued to advance

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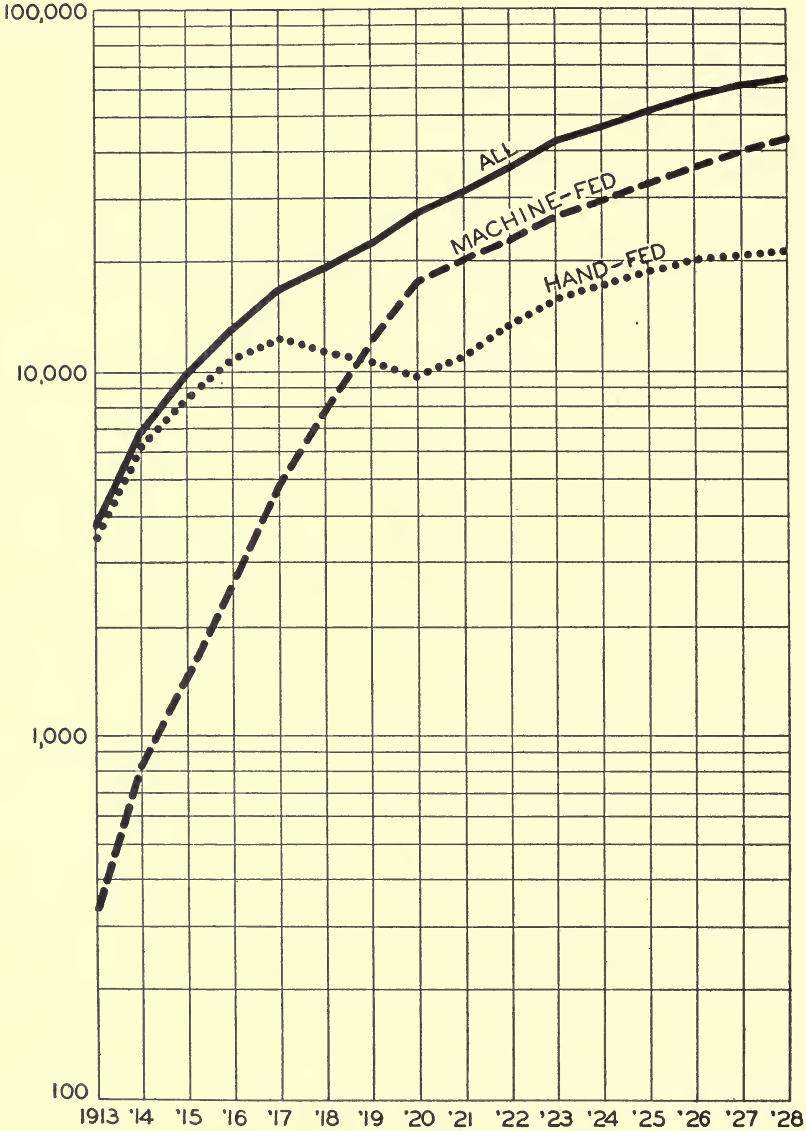
[17] The temperature in the pressroom must be kept steady at about 70°. Humidity makes the paper expand and aridity causes it to contract, destroying accurate register for color work. The continuous feeder is more susceptible to atmospheric conditions than the pile feeder because the paper is more exposed to the air, usually requiring protection by an oil cloth covering when the press is not running. For this reason it is suited to long-run, continuous feeding.

CHART III

RELATIVE GROWTH IN THE SALES OF HAND-FED AND MACHINE-FED PRESSES IN THE UNITED STATES, 1913-1928

Rotaries omitted. The slopes of the lines are comparable at every point and they mean rates of growth from period to period.



until by 1928 they comprised more than 50 per cent of all mechanically-fed machines acquired that year.

Color and perfecting presses were also rapidly equipped for automatic feeding during the war, and they have so continued to develop that there is little hand-feeding left on these presses today.

This rapid adoption of the new printing techniques is even more impressive when the purchases by printers in 1928, the last year of the series, are compared with those of 1913, the first year. While in 1928 less than ten per cent more presses were purchased than in 1913, the numbers that were hand-fed and machine-fed were practically reversed:

Presses Purchased in 1913		*Presses Purchased in 1928*	
Hand-Fed	3,429	Hand-Fed	707
Machine-Fed	328	Machine-Fed	3,382

Noteworthy as these figures are, however, in showing us what kind of printing machinery is being installed today as compared with yesterday, we must be careful not to let them confuse the picture. For it must be remembered that yesterday's presses are still a part of the present printing scene. Presses purchased each year must be thought of as being added to those already in use, because of the long life of printing machinery—from fifteen to twenty-five years.[18] The sixteen-year cumulative period depicted represents what may roughly be called a press generation. Unfortunately, a generation of presses, like a generation of people, is not a clear-cut thing. There is premature death and extra long life. Moreover, we have no census of printing-press population. Inquiry yields the fact that the first press sold by one important manufacturer in 1882 is still printing its weekly sheet near Syracuse, New York. Also, one large New York City plant reports that 90 per cent of its presses were purchased prior to 1913.

These instances appear to be exceptions. It is probably safe to estimate that at least three-fourths of the pressroom equipment now in operation has been acquired since 1912. The number of presses that have been discarded and the number that were installed before 1913 which are still running may cancel each other to a large degree. This would heighten the accuracy of the present picture. At any rate, it seems safe to think of installations of presses since 1912 as roughly indicating press equipment in use at the present time, the older models becoming less important as the new models become more so.

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[18] From the survey of New York plants which is described in Chapter III, the rate of discarding presses was somewhat faster in large plants than in those of medium size, and in non-union than in union shops. Judging from their rate of discard during the five years, 1924–29, nine union plants averaging 32 presses each would completely renew their equipment in 21 years, 36 union plants averaging 10 presses each would take 26 years for complete renewal, while 8 non-union shops averaging 6 presses each were discarding at the rate of complete renewal in 23 years.

That this advance in the use of the new techniques is truly country-wide and not concentrated in the large cities is evident in the spread of press sales. From 1913 to 1929, more than two-thirds of all cylinder presses purchased were installed outside of the large centers, where sixty per cent of the printing is done. Moreover, this sixty per cent of printing is so thoroughly diffused throughout the land that no one city prints more than one twenty-fifth of the country's total, and only about a dozen cities print as much as one per cent of the total supply. The large centers are New York City and Chicago which together produce two-fifths of all commercial printing in the United States. While these cities, as compared with the rest of the country, made about four per cent greater use of the new-model presses in 1928 as compared with 1913 and five per cent less use of the older presses, they absorbed less than one-third of all the cylinder presses sold during the sixteen-year period.[19]

Thus it is manifest that technical advance in the commercial printing pressroom is relatively widespread in the United States, and that, in general, it is to be found wherever there is printing. Consequently, it would seem entirely possible that the effects of mechanization upon the employment of workers in the large printing centers of New York and Chicago may be reflected throughout the country.

[19] According to the census figures, shown in full in Table 15, Appendix A, p. 220, New York and Chicago produced their 40 per cent of the country's printing with one-third of the workers and paying about 38 per cent of the total wages. Their average output per man was $2,242 in 1914 and $4,313 in 1929 whereas for the rest of the country the averages were $1,728 and $2,914 respectively.

4. WORKERS, PRESSES AND PRODUCTIVITY IN 1914 AND IN 1927

Before passing on to the more intimate scenes of the New York City pressroom where we shall search for the effects of mechanization upon employment, reference to the United States census figures helps to give some interesting rough outlines:

TABLE II

WAGE EARNERS, COMMERCIAL PRINTING PRESSES AND PRODUCTIVITY IN THE UNITED STATES, 1914 AND 1927[a]

Year	Number of Wage Earners	Value Added by Manufacture	Presses Sold up to and Including Year Given	Square-Inch Printing Capacity of Presses Sold up to and Including Year Given
1914	113,121	$214,961,905	68,362	33,207,000,000
1927	141,278	$446,853,963	121,525	65,638,000,000
Per Cent of Increase	24.9	107.9	77.8	97.7

[a] The census does not give the number of pressroom employees separately. Value added by manufacture has been corrected for the change in the value of the dollar by applying index numbers of wholesale prices of the United States Bureau of Labor Statistics. Presses sold are as reported to the writer by manufacturers. Square-inch capacity was calculated by a carefully evolved formula stated simply as follows: sheet-size of press x the number of presses x the number of impressions per hour. The color-and-perfecting-press figure then had to be multiplied by two. While we cannot show the increase in presses and printing capacity for 1929 over 1914, the census shows that the number of workers increased to 33 per cent over 1914 and the value added by manufacture increased to 135 per cent. The computation of press productivity is explained more fully in Research Note 2, Appendix C, pp. 261-65.

The census does not list separately the pressroom employees in whom we are most interested, so we must be content with the report for all departments of book and job printing. The omission in the book and job census of all those periodicals which are grouped with newspapers tends to offset, in the figures here presented, the absence of rotary presses among the presses sold.

Table II shows that while printing production rose more than 100 per cent from 1914 to 1927, it required only 25 per cent more workers. Printing presses increased 78 per cent while their printing capacity almost doubled. The changes indicate that each worker produced some three-fifths more printing in 1927 than in 1914, that the advance of employment was thereby retarded, but that the larger demand[20] for printing could be met only by substantial increase in the number of workers.

5. SUMMARY

Summing up the findings presented in this chapter, we see that:

(1) There has been marked advance in the mechanization of the commercial printing pressroom, consisting of large accretions of presses, of the gradual replacement of old models by new, and of hand-feeding by automatic feeding.

(2) This advance in mechanization is not concentrated in New York and Chicago where forty per cent of all commercial printing in the United States is produced. On the contrary, it is diffused throughout the country and coincides fairly closely with the expanding production of printing.

(3) Rough figures show that an increasing amount of book and job printing is produced with relatively fewer men, but that a greatly enlarged demand for printing has carried with it an absolute increase in the number of workers employed.

(4) Even though the number of workers has risen and mechanization has been relatively gradual, these mechanical changes prompt the question: *Have men been displaced?*

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[20] Another indication of growth in the demand for printing is that the weight of second class matter mailed through the United States Post Offices, as reported to the writer, rose from 1,057,607,512 pounds in 1913 to 1,629,741,362 pounds in 1930, or 55 per cent.

CHAPTER III

WHAT TOOK PLACE IN FIFTY-THREE NEW YORK CITY PRESSROOMS

The largest printing center in the United States is New York City. In the borough of Manhattan one out of every seven industrial wage earners is employed in printing, and the number of book and job plants is more than two thousand. Consequently New York City was chosen for a close-range study of the effects of improved press machines upon the employment of pressroom workers. As has already been intimated, here is to be seen the advance of mechanization in a little more exaggerated form than for the country as a whole. Here new presses are installed rather more rapidly than elsewhere in the United States, while the installation of older presses has declined more than proportionately.

More is said of this relative mechanical progress of New York City in Chapter V where the two large centers, New York City and Chicago, are compared. Aside from the quantitative importance of these two cities, the contrasting policies of their employing printers with regard to organized labor make comparison of their adoption of the new techniques of special interest.

1. FIVE-YEAR CHANGES IN MACHINES AND MEN

In the present chapter we are concerned with what has taken place inside the printing plants of New York City. What changes have occurred in representative pressrooms and what has been their effect upon employment? In the rough analysis for the country as a whole, it will be recalled, the federal census reports indicated that while employees in all departments of book and job printing had not increased so rapidly as new printing presses would demand, their absolute number was substantially greater, each worker producing more than before. When we focus our lens upon the pressroom alone, what do we find? How much has the employment of pressroom workers (of pressmen, and press-feeders or assistants) fallen behind that of press equipment as the new machines have been installed, and how much has the production per man grown?

Our answers to these questions are to be based largely upon what took place in fifty-three of New York's two thousand or more printing offices during a five-year period.[1] This period extended from the winter of 1923–1924 to the winter of 1928–1929, ending just before the present depression began. The plants selected for the survey are representative of those firms in which from six to fifty men work in the pressrooms. Such firms employ two-thirds of all the commercial printing workers in New York City. Not any of the hundreds of small neighborhood offices were included, for all of these firms together employ relatively few men.

The fifty-three printing offices selected for the survey are representative on two more scores. First, from the standpoint of stability. It was necessary of course to include relatively long-lived plants in order to photograph changes over a five-year period; and it proved less difficult to find enough firms that could meet this qualification than was at first feared. Careful checking of a large sample of the shops operating in 1923 and 1924 revealed that sixty-seven per cent of them were still in business under the same management in 1928 and 1929.[2]

Second, these fifty-three establishments are representative from the point of view of the organization of their labor—forty-five of them being union shops and eight of them non-union shops. These numerical proportions are in exact ratio to the estimated production in New York City by union and by non-union firms—eighty-five per cent having been produced in closed shops and fifteen per cent in open shops.[3] The list of forty-five firms employing union labor was still more in keeping with actual conditions by being composed of a larger number of medium-size plants than of large establishments. Thirty-six of these shops employed from five to twenty men in their pressrooms, the average being eleven, while nine employed more than twenty men, with an average of fifty.[4]

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[1] All but ten of these belonged to the New York Employing Printers' Association, of which the membership was then 461. It is possible that these 53 plants made more mechanical changes than other offices of comparable size but inquiry seemed to indicate that the difference was inconsiderable.

[2] The *New York Printing Trades Blue Book* was used for this comparison.

[3] *Wage Scales Where Reported*, issued monthly by the United Typothetae of America. Eighty per cent of the membership dues received by the New York Employing Printers' Association were paid by the Printers' League (closed shop) Section.

TABLE III

Press Equipment and Men in Fifty-Three New York City Pressrooms, 1924 and 1929[a]

Presses and Men	1924	1929	Per Cent Change
Presses	694	802	+15.6
Hand-fed	333	271	−18.6
Machine-fed	361	531	+47.1
Old models[b]	477	427	−10.5
New models[b]	217	375	+72.8
Percentage of hand-fed of the total	48.0	33.8	−29.5
Percentage of old models[b] of the total	68.7	53.2	−22.6
Total men employed	823	958	+16.4
Pressmen	346	434	+25.4
Percentage of total men—all presses	42.0	45.3	+ 7.9
Percentage of total men—old models[b]	36.6	36.6	± 0.0
Percentage of total men—new models[b]	52.9	56.4	+ 6.6
Assistants	477	524	+ 9.8
Hand-feeders	247	206	−16.6
Operators	230	318	+38.3
Percentage of total men on all presses	58.0	54.7	− 5.7
Percentage of total men—old models[b]	63.4	63.4	± 0.0
Percentage of total men—new models[b]	47.1	43.6	− 7.4
Percentage of hand-feeders of total assistants	51.8	39.3	−24.1

[a] Tables 6 and 7, Appendix A, pp. 206-8, present corresponding data for each of the three groups of plants separately. Appendix table 8 shows in greater detail the equipment on the floors of these plants together with the number of men actually employed and the number who would have been employed according to collective agreement with the unions had all presses been running. The tabular views in Chapter IV show samples of these pressrooms in process of change.

[b] The terms "old models" and "new models" will be used throughout the following pages and have been adopted more for convenience than for strict accuracy. "Old models" include all platens and large cylinders whether or not they are machine-fed. "New models" comprise all small cylinders even though a few are hand-fed. They also include color and perfecting presses and rotaries which are not especially new but which could only be grouped here because of their labor-saving character.

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[4] The average number of workers in the non-union pressrooms was seven. While printing offices vary greatly, perhaps it is safe to say that pressroom workers comprise about twenty per cent of the total men employed in composing room, pressroom and bindery.

The investigation of these fifty-three plants[5]—nine large and thirty-six medium-size union offices, and eight non-union offices—had the advantage of being made from beginning to end by a single highly-qualified investigator whose ability and fairness was attested by both employers and men.[6] For summary findings in respect to the replacement of workers by machines, Table III presents the tabular picture.

All but two of the fifty-three pressrooms had undergone technical change during the five-year period. All but these two had either replaced some of their old presses by new, or had harnessed hand-fed presses with automatic-feeding attachments. The total number of machines on the fifty-three floors was 694 in 1924 and 802 in 1929, an increase of 15.6 per cent. The total number of employees was 823 in 1924 and 958 in 1929, or an increase of 16.4 per cent. Thus, surprisingly enough, men increased slightly more than presses. Where 118.6 men were employed to operate 100 presses in 1924, it took 119.5 (practically an additional man) to 100 presses in 1929.[7]

The full significance of this increase in employment can be discovered only by differentiating between the older and the newer models. For, whereas the number of men on each 100 older presses increased 9 per cent,[8] the number on each 100 new presses fell 11 per cent. This is the story one would expect to hear—that the introduction of labor-saving machines causes employment opportunities relatively to shrink. Moreover, the decline in employment on the newer machines leads to the supposition that, had the period of investigation been ten years instead of five, giving time for more substantial replacement of old models by new, the number of men employed to operate each 100 presses might by then have been found actually to have fallen, in contrast to the rising figures for this five-year period.

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[5] Exhibits 6 and 7, Appendix B, pp. 234-35, present reproductions of the schedules used.

[6] The records taken of press equipment stood an interesting test. In 1924 a survey of cylinder presses was made in some 250 New York City plants by the Labor Bureau, Inc., for Press Assistants' Union No. 23. Replies on the schedules had been entered by the chapel chairmen in each plant. The list of shops included practically all of the 53 here studied, so that these equipment records taken in 1929 for the year 1924 could be compared with those of the Labor Bureau that had been gathered in 1924. The comparison revealed practically identical listings of press equipment. Reports for two plants varied somewhat. Upon investigation, the error in one case proved to be on the earlier schedule, while no check could be made in the other plant. The problem of tabulating press equipment is explained in Research Note 2, Appendix C, p. 261.

[7] Table 8, Appendix A, p. 209, shows the number of men employed per 100 presses in each of the three groups of plants.

[8] Analysis proves this to be due largely to an increase in the number of hand-fed platens and of over-size cylinders. Furthermore, if the presses were used more of the time in 1929 than in 1924, or/and if the ratio of make-ready to running time was greater, these would be other explanations of the increase in the ratio of men to presses. Exhibit 12, Appendix B, p. 242, shows the "Standard Complement of Men in New York City Union Shops" and Tables 20-23, pp. 225-28, show the measurements of machine employment.

Contrary to general expectation when labor-saving machines are introduced, even this short period of inquiry reveals an increasing emphasis upon skill in the pressroom. As the special job of assistants, that of hand-feeding the press, is displaced by a mechanism, the findings reveal that the relative demand for assistants falls, while for pressmen it rises. The table just presented for the fifty-three printeries shows that pressmen increased about two and one-half times as much as did their assistants. The percentage of pressmen employed rose on both old and new models, while for assistants it fell. And what is perhaps even more significant as pointing a trend is that a very much larger relative number of pressmen were employed on the newer presses than on the older, both in 1924 and in 1929. On the older presses, the proportion of pressmen to assistants was about one to two, whereas the newer models employed an average of more than one pressman to each assistant.

As for the feeding of the presses, the generic function of press assistants, we see that while hand-feeders fell off a little less than hand-fed presses (because they sometimes operate the automatic attachment as well) assistants employed as operators of mechanical feeders failed by a good deal to increase as much as automatically-fed presses. Consequently, as the hand-feeding process disappears and the duties of the press assistant become diffused, he loses his hold on employment in the pressroom, on the old-model presses as well as on the new. In the 53 plants, the net loss of employment for assistants was 5.7 per cent, while the pressmen gained 7.9 per cent.

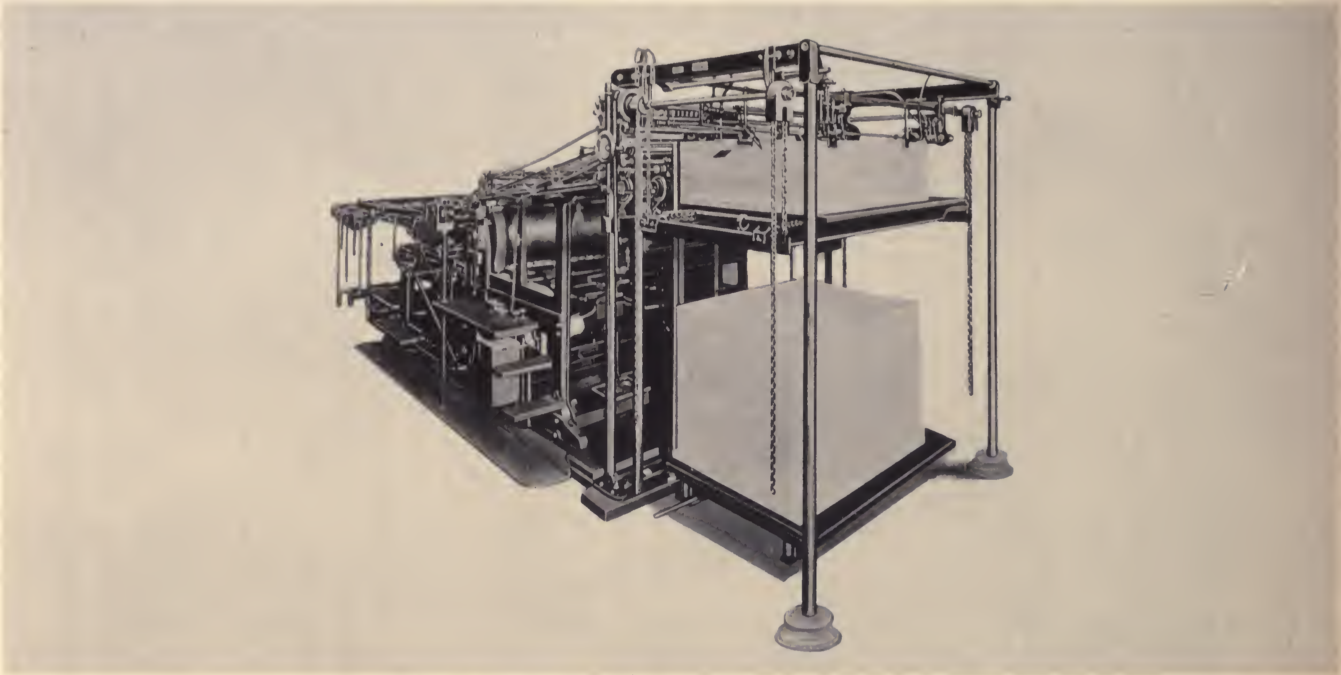
Thus it appears that two separate currents in the stream of employment have sprung from the installation of the new printing equipment: not only do the new machines tend to reduce the employment of men but they cause a progressive displacement of semiskilled assistants by skilled pressmen. The net dislodgment of men seems small, however, in the face of so much mechanical progress—a fact which apparently reflects increase in the demand for printed products.

2. The Duties of Pressmen and of Press Assistants

Some knowledge of the nature of the work of pressmen and of press-feeders or assistants will make the meaning of these changes in their employment more clear. The skill of the pressman is of a high standard of craftsmanship. He must be a skilled mechanic and he must have good color sense for mixing inks unless he is confined to black printing. Some general education and executive ability are necessary, as well as the character to assume responsibility. In the last analysis the pressman is responsible for production and for the quality of work.

When the type-form comes from the composing room, the pressman locks it on the bed of the press and prepares it for printing. It must be made "type high" to give even impressions. A gauge is applied and any matter that needs raising is marked and underlayed, while that which must be lowered is shaved down. A proof sheet will then indicate what further "packing" is required. The pressman marks the sheet so that other "underlays," "interlays" and "overlays" may be made. This is "make-ready" process and requires skill and judgment. Proper ink distribution is another responsibility of major importance, and the delivery mechanism must be kept in smooth running order to receive the printed sheets. Finally, the pressman frequently helps or even superintends the assistant in setting the automatic feeder.

The assistant has a more variable job. If he is sufficiently intelligent and willing to take initiative he will probably assist the pressman in most of the processes just described. Basically, however, he does the feeding and helps with the make-ready, patching up by the markings which the pressman has made. If he is a hand-feeder he stands at the feed-board and inserts one sheet after another, taking care to place them against the guides, as has been described. Periodically he replenishes the pile of blank paper and, when printed, he assists the pressman in re-



LARGE FLAT-BED SINGLE-CYLINDER PRESS, SHOWING THE AUTOMATIC PILE-FEEDER ATTACHMENT WHICH IS LOADED FROM THE FLOOR

moving the printed sheets from the delivery table. In some plants he is expected to watch the platen-press "color."

The assistant who operates an automatic feeder is expected to know how to adjust this device at the start of each new job, though not infrequently he has to be taught this process by his pressman. The operating assistant also works on the make-ready, loads up the feeder and frequently helps to remove the piles of printed paper unless these have been delivered automatically from the press. The "continuous" mechanical feeder stands high and necessitates carrying heavy paper up six steps for loading, at intervals of about every half hour through the day. A picture of this attachment is shown facing page 120.

From this brief review of their duties it is clear that there are new ways in which assistants can aid their pressmen when relieved of the monotonous task of feeding the press.[9] It is important to observe even at this point, however, that the very diffusion and miscellaneous character of these duties as compared with the specific and indispensable job of hand-feeding appears to be the development that reduces the demand for assistants. It may even mean their gradual elimination from the pressroom. For as a matter of fact, assistants as a group, in contrast to pressmen, are an unselected lot with no special aptitude for mechanics or for assuming the responsibilities of printing production.

This lack of selection has hastened the diminishing importance of the assistant in the eyes of the employer as the new machines have been installed. Employers contend that it is more economical to reduce the number of presses over which a pressman has charge so as to include in his functions the operation of the feeding mechanism and any other work that the assistant performs, thus rendering the assistant unnecessary. In not a few cases pressmen are paid premium wages not only for superior work but for including assistants' work within their own.

The findings just outlined for the entire group of fifty-three plants in regard to pressroom employment are, interestingly enough, also true in the main for each of the component groups—

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[9] In Chapter IX, the personnel relations between pressmen and assistants that grow out of this close association will be discussed.

for both the large and the medium-size union shops and for the medium-size non-union shops. More details of the analysis are shown in the appendix[10] for all who care to see, and the finer variations between union and non-union pressrooms are given special attention in Chapter V. In the chapter just following, we shall examine much more closely the actual effects of new machine installation upon the individuals employed. For what has been said so far of employment and its changes, showing that workers are unevenly affected, provokes a further important question: Does the displacement of old jobs or processes bring with it the actual dislodgment of the old-fashioned workers—the manual feeders—in order to make way for the operators of automatic feeders, or can these men be transferred from old processes to new?

Before passing on to this important and more specialized phase of the inquiry, however, there are other pertinent questions to consider. Do machines induce under-employment, if not the discharge of men? How important is the growth in the productivity of individual pressroom workers?

3. Has Part-Time Employment Increased?

Does improved machinery reduce the amount of full-time employment which men receive in the pressroom? Common belief is that it does. The new machines run off their impressions more rapidly, the men finish each job in less time and are not working the rest of the time. Also, if work formerly done on the old machines is now done on the new, this would seem to point to under-employment for the men on the old machines. This reasoning seems sound so far as it goes, but its practical truth depends upon whether the orders for printing increase, and whether the improved quality or the nature of the work requires greater care in making ready the forms. It is possible, of course, for these advances to be sufficient to supply workers with as much employment as they had before, in spite of their greater productivity.

In this investigation a great deal of time was spent in an attempt to measure the amount of employment that pressroom workers receive. But for the most part, the necessary plant records were either inadequate or non-existent. It was possible, however, to make a limited analysis in six of the large establishments. These firms obligingly supplied from their pay rolls the records of the number of hours worked by each man employed in the four weeks of March, 1924 and of March, 1929. March is representative of the busier months in commercial printing and the corresponding figures for these two years would seem to be reasonably comparable—both years being characterized by relative prosperity.

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[10] Table 7, Appendix A, p. 208.

The data were analyzed from two angles. First, as shown in Table IV, to see whether employing printers were purchasing more or fewer full-time labor-weeks in 1929 than in 1924; second

TABLE IV

DAYTIME LABOR-WEEKS[a] WORKED BY PRESSMEN AND ASSISTANTS IN SIX LARGE NEW YORK CITY PRESSROOMS DURING FOUR WEEKS OF MARCH, 1924 AND MARCH, 1929

LABOR GROUP AND TIME PERIOD	LABOR-WEEKS				PER CENT CHANGE
	1924		1929		
	Number	Per Cent of Total	Number	Per Cent of Total	
Pressmen and Assistants					
Total	982	—	1109	—	+12.9
Pressmen					
Total	385	100	485	100	+26.0
Full-time weeks [b]	102	26.5	133	27.4	+30.4
Over 44 hours	197	51.2	253	52.2	+28.4
Under 44 hours	86	22.3	99	20.4	+15.1
24 hours and less	*16*	*4.2*	*13*	*2.7*	−18.8
Assistants					
Total	597	100	624	100	+ 4.5
Full-time weeks [b]	110	18.4	115	18.4	+ 4.5
Over 44 hours	307	51.4	324	51.9	+ 5.5
Under 44 hours	180	30.2	185	29.6	+ 3.1
24 hours and less	*41*	*6.9*	*37*	*5.9*	− 9.8

[a] By a labor-week (or "week") is meant any number of hours which one man worked during any one of the four calendar weeks.

[b] Full-time in New York City union shops is 44 hours on the day shift and 40 hours on the night shift.

(Table V) to discover to what extent men received four full weeks of employment in March, 1929 as compared with March, 1924.

The results of these analyses emerged as something of a surprise. They show, first, that at least in these plants, in spite of a forty per cent increase in new-model presses which included thirty-five per cent more automatic feeding and as much less hand-feeding, more full-time labor-weeks of forty-four hours were purchased rather than less. While men worked all the way from one to ninety hours in a week, the median length of the "weeks" worked was 44.3 hours in 1924 and 44.5 hours in 1929. Three-fourths of the labor-weeks purchased were more than 41.5 hours in 1924, and 42.25 hours in 1929. One-fourth were more than 49.5 hours in 1924, and more than forty-nine hours in 1929.

As for the experience of pressmen as compared with press assistants, this analysis once more emphasizes the relative gains of the pressmen. Whereas the number of full-time weeks for pressmen rose 30 per cent, for assistants they rose only 4.5 per cent; for pressmen overtime rose 28 per cent and for assistants 5.5 per cent. While the "weeks" amounting to less than full-time rose more for pressmen than for assistants, the number of weeks of three days or less fell 19 per cent for pressmen and 10 per cent for assistants.[11]

TABLE V

DAYTIME HOURS WORKED BY PRESSMEN AND BY PRESS ASSISTANTS IN SIX LARGE PLANTS IN FOUR WEEKS IN MARCH, 1924 AND IN MARCH, 1929[a]

Time Period	Pressmen [b]		Assistants [b]	
	1924	1929	1924	1929
Average hours straight-time	151.6	155.4	143.6	138.8
Average hours overtime	14.7	14.6	16.4	14.7
Total average hours	166.3	170.0	160.0	153.5

[a] Tables 18 and 19, Appendix A, pp. 223-24, present the complete data for both day and night shifts.

[b] Pressmen numbered 105 in 1924 and 126 in 1929; assistants numbered 165 in 1924 and 182 in 1929.

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[11] Corresponding findings for the night shift are presented in Table 16, Appendix A, p. 221.

Turning to the reverse side of the shield to discover how much working time throughout the four weeks the men in the six pressrooms received, again we find somewhat steadier employment for pressmen, and somewhat less steady for assistants. Table V shows that including overtime hours the pressmen received an average of 170 hours during March, 1929, or only six hours less than full-time. Since the wage scale is higher for overtime this means that pressmen on an *average* received slightly more than a full month's pay. The average number of hours for assistants in 1929 was 153.5—a seven per cent drop from the average for 1924.

The proportions of pressmen and press assistants working on the day shift who received at least three full weeks of straight-time employment with enough overtime to bring the whole up to at least 176 hours, the equivalent of four weeks of full-time work, were:

Employees	*1924*	*1929*
Pressmen[12]	84.7	86.5
Assistants[12]	77.6	77.9
Total men[12]	80.0	81.5

This means that in March, 1924 only 15.3 per cent of the pressmen and 22.4 per cent of the assistants on the payrolls of these 6 plants received less than full-time pay, and in 1929 these proportions dropped to 13.5 per cent of the pressmen and 22 per cent of the assistants. Of course we cannot tell from the data in hand whether or not these part-time employees obtained more work in other printeries.

Thus in this limited analysis of establishments that have improved their pressroom equipment, we do not find more part-time employment. We discover, on the other hand, that employment is somewhat more full and more steady than before. We have had to consider all equipment together because permanent plant records did not show time worked by press groups. Moreover, these findings are not conclusive because of the small number of plants which yielded them. Also, these plants were among the largest of the group where employment conditions in general may be

[12] Pressmen and assistants in these groups numbered 89 and 128 in 1924 and 100 and 142 in 1929, making the totals 217 and 251 respectively.

more favorable to workers, and where there was considerably less mechanical change during the five-year period than in the smaller offices.

It may be that if the facts could have been extracted from all of the establishments included in the survey they would have supported the very prevalent conviction among the men that the new machines have caused their work to dwindle. "Too little work" was by no means an infrequent explanation of the reason for quitting their jobs given by pressroom employees when they were interviewed in connection with this study, as we shall see in the chapter which follows.

4. How Busy Are the Machines in the Pressroom?

To what extent did the greater amount of employment of pressroom workers in 1929 reflect more continuous use of the presses on the floors? How much, if any, more are the new presses used than the old?

Five of the same six firms coöperated further in the investigation of these points. Records for the full twelve months of 1924 and of 1929 were submitted to the writer. By dividing the total number of straight daytime hours which each group of presses could have been operated for the year into the total number of hours which were actually charged against them for that year, it was easy to see how much more or less than full straight daytime they were used.

The findings from this index of machine employment are in interesting consonance with those already described.[13] Considering all presses together in 1924, they were operated nine per cent more time than the day shift afforded; *i.e.*, the ratio of chargeable hours to day-shift-capacity hours was as 109.1 to 100. In 1929, this ratio rose to 117.7 to 100, showing an eight per cent increase in the use of press equipment. Comparing the use of the new models with that of the old, we find that the ratio of total chargeable hours to day-shift-capacity hours was:

New models:	94.9 in 1924, and 119.8 in 1929
Old Models:	116.1 in 1924, and 117.0 in 1929

Here we have further evidence of two of the findings which recur in the course of this study: (1) The installation of improved pressroom equipment has been exceeded by the growth in the demand for printing, thus more than maintaining the demand for the labor of men.[14] (2) The labor-saving presses are progressively taking work away from the older models. To be sure these ratios apply only to the large plants in New York City, but it is probable that were the data available in the medium-size plants they would show the same trends.[15] In fact, in so far as the verbal testimony of printers is reliable, we should find a greater difference in the use of new and old presses in the smaller shops than in the large. For here much of the equipment is in small machines where the new speed presses are particularly important.

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[13] A complete summary of the findings is presented in Tables 20 and 21, Appendix A, pp. 225-26.

5. The Question of Productivity

And now what about the productivity of the improved commercial pressroom? How rapidly does it actually increase? To what extent do the new techniques enable each worker to turn out more printing?

It will be recalled that for the country as a whole a 78 per cent increase in the number of presses from 1914 to 1928 raised the hourly square-inch printing capacity nearly 100 per cent. And since the federal census reports reveal a rise of only 25 per cent in the total number of book and job workers, the conclusion was reached that the productivity both of presses and of men had appreciably advanced. Moreover, the larger increase of 108 percent in the value added by manufacture during this period seems to indicate in this rough calculation that either the quality of the production or its price to the consumer also rose, or perhaps both. This was all that the figures which were presented in Chapter II revealed.

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[14] Comparisons were also made between make-ready and running time for the two periods. (Table 23, Appendix A, p. 228.) The expectation was that, owing to the increase in short-run work, the ratio would have risen, thus tending to require more labor. But this was not so in these plants. There had been practically no change over the five-year period. Two explanations can be made, for it is commonly agreed that New York City does more short-run work now than before. One is that faster methods of making ready have been devised. The other is that New York City firms may be doing more work of inferior quality than before. One proprietor told the writer that, whereas in 1924 they did 48 hours of make-ready on a certain high class illustrated magazine, they now do 7 or 8 hours on "pulp" fiction magazines.

[15] One apparent support for this theory is that in the union pressrooms *increases* in the number of employees to each 100 presses in 1929 over 1924 were actually greater than the union agreements called for, and *decreases* were fewer. The findings came to light from a comparison of the number of men who were *actually* employed with the number who would have been employed had all presses been running with the full complement of men. The actual number employed was of course less than this theoretical number. The figures may be seen in Tables 8 and 9, Appendix A, pp. 209-11.

The question of productivity in commercial printing is knotty, and analysis can be only fragmentary and suggestive. The reason for this is that no satisfactory unit of measurement of quality and quantity combined has been devised. The product is almost infinitely variable, because of the different grades of work and of paper and ink, the variation in the length of the runs and in the number and kind of illustrations, also in the wide range of press equipment used on the same as well as on different kinds of work. Some of the practical difficulties of measuring printing and its cost may be quoted from one printer of wide experience:

> Two forms of the same size with the same number of cuts may easily vary from two hours to two days in the time of make-ready. When the time-sheets of a pressroom show that one cylinder delivered 25,000 impressions one week and its twin standing alongside, operated under similar conditions at the same cost delivered 60,000 sheets, how is any estimator going to calculate exactly what will be the time and cost of the runs on these machines the following week?[16]

We turn, then, to a theoretical analysis of pressroom production. Barring all consideration of quality of product because of its immeasurability, the thirty-six union offices in New York City with which we are familiar will supply the base. Even this limited measurement must, unfortunately, be one of *capacity* rather than of *actual* production—that is, as though all presses were in operation at one time and printing the full width of their beds. Also, man-hour production and relative wage costs of printing on old and new equipment can be calculated only for union pressrooms in which the complement of men and the wages paid are standardized. In barest outline these computations are set down in Table VI for what they are worth to the reader.[17]

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[16] Charles Francis, *Printing for Profit*, p. 328.

[17] Tables 10, 11 and 13, Appendix A, pp. 212-18, show the complete computations by press groups and for pressmen and assistants separately for the 36 medium-size and the 9 large union shops. They are discussed more fully in Appendix C.

Here we find a 29 per cent rise in the total printing capacity of these thirty-six pressrooms during the five-year period, with a 129 per cent increase on the new models—clearly reflecting a marked drop in the capacity of the old models. The total number of men employed according to standard calculations rose a little less than the total number of presses, but the increase in the number of new models caused a 115 per cent increase in the number of men employed to operate them.

TABLE VI

Printing Capacity, Man-Hour Production and Unit Wage-Cost in 36 New York City Union Pressrooms, 1924 and 1929 (Standard Calculations[a])

Productivity Item	1924	1929	Per Cent Change	Per Cent on New Models		Per Cent Change on New Models
				1924	1929	
Total capacity (In thousands of square inches)	338,136	436,028	+29.0	22.3	39.5	+128.9
Number of men employed	405	466	+15.1	17.8	33.2	+115.3
Man-hour production (In thousands of square inches)	835	936	+12.1	—[b]	—[b]	+ 6.3
Average wage-cost per million square inches (In dollars)	1.138	1.137	− .1	—[c]	—[c]	+ 10.1

[a] The method of computing square-inch capacity was explained on p. 25, above. The number of men employed and the wages paid were computed according to the trade agreements which ruled in union shops in 1924 and in 1929 as shown in Exhibit 12, Appendix B, p. 242.

[b] Man-hour production on the new models was 33 per cent more than on the old in 1924, and 31 per cent more in 1929. (Table 13, Appendix A, p. 218.)

[c] Although the wage-cost on the new models rose during the five-year period, it was only 78 per cent of the wage cost on the old models in 1924, and 85 per cent in 1929. (Table 13, Appendix A, p. 218.)

These changes were probably to be expected, but, when we come to consider production per man and its wage cost in this light, the results of the computations present something of a surprise. The average output per man per hour on all presses rose 12 per cent as the table shows, but it rose only six per cent on the new presses. Moreover, the average wage cost per unit of printing fell only one tenth of a point, from $1.138 to $1.137, on all presses combined, and on the new models it actually increased 10 per cent.

Unexpected as these findings are, their significance must not be overemphasized because of the theoretical nature of the computations—as though the presses were printing at the capacity of their beds on the same kind of work. Briefly stated, the apparent failure of the new models to maintain their superiority over the old models is explainable on two grounds: (1) The relative square-inch printing capacity on the new models registered a reduction at the end of the five years because the proportion of the larger sizes among them had fallen off, whereas among the older models this proportion had risen. Furthermore, this standard calculation overestimates the number of square inches of paper which the large cylinders actually print,[18] for in practice the forms on large cylinders do not cover as much of the bed as they do on the smaller high-speed presses. Considerations of the nature of the work, which we were obliged to disregard, would enter into the explanation of why this is so. As, for example, when the form contains "solids" in which a great deal of solid "color" is used, the results are better when the printing is done on a larger, less-rapidly-moving bed, where inking can be generous as well as smooth. (2) The wages of both pressmen and assistants rose during the five-year period with no reduction in the standard complement of men. In so far as this standard complement was employed, which it was not always,[19] this would increase the average wage cost per unit of capacity production,[20] and, in accordance with what has just been said, the rise would appear greater on the new models.

[18] Also it must be remembered that large cylinder presses stand idle more than the new presses.

[19] Battles were raging during these years between employing printers and the assistants' union over the complement of men. These will be described in Chapter VI and they will convince the reader that, with little question, the number of men actually employed was not in strict keeping with those agreements made. Comparisons of the number actually employed with those who would have been employed by agreement with the unions had presses been running at capacity are shown in Tables 8 and 9, Appendix A, pp. 209-11.

[20] Wage-cost is less than 50 per cent of the total cost of production, and, of course, pressroom quantity output is only a limited index of what the printer receives.

The most that can be said of these productivity calculations is that they may be suggestive of the actual situation, which remains unknown.[21] If it is true that printing in New York City tends to be more expensive per unit on the newer presses, the explanation of why this is so would differ according to whether it came from the lips of an employing printer or a union official. The employing printer would, I think, readily assert that these higher costs are a direct result of the unions' insistence upon too large a complement of men, at high wage scales, to run these presses. Part Two of this book narrates the long struggle between employers and men over this point. On the other hand, the union officer would explain that with less spoilage the men are producing a finer quality of printing which is reflected in these higher unit costs,[22] (and which was necessarily excluded in the present calculations). The union man would also agree that these cost figures may reflect the successful attempt of organized workers to participate in the benefits of labor-saving machinery.

Wage-cost per dollar's worth of commercial printing can be computed from the reports of the federal census. This price index, corrected for the changing value of the dollar, has advantage over the measurement by square inches, just discussed, in that it includes the *quality* item as well as that of *quantity*. But as an indicator of per-capita productivity it is weakened[23] by a third factor—that of its being a highly competitive price which includes elements quite outside of cost of production. For example, if wage-cost per dollar's worth of printed matter remains stationary, it may imply an increased volume or quality-output per man which is greater than any increase in wages but counteracted by a lower price to the consumer. Here the employer would gain nothing except good will, while the workers would enjoy more wages and the consumer more printing. If, on the other hand, this wage cost goes up, it may imply that wages rose higher than per capita output, and that the price received from the consumer was not high enough to compensate the employing printer. Here, the employer would seem to be the loser while the worker gained a higher average wage for less production, the consumer being perhaps the least affected. If, in a third case, this wage-cost falls, it may indicate an increased output per man greater than the increase in average wages, with a price received from the consumer sufficiently high to bring advantage to the employing printer. Here, both employer and employee would seem to gain, the lot of the consumer being left unknown.

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[21] Research Note 2, Appendix C, pp. 261-65, explains a little further the attempt to measure productivity.

[22] This assertion would seem to be partially attested by the fact that a large proportion of skilled pressmen at higher wages than those of the semiskilled assistants were employed in 1929 than in 1924.

[23] Also the census figures are for all departments of the industry—composing room and bindery as well as the pressroom.

In so far as the census data for the entire book and job industry can guide us in this analysis of pressroom productivity, they seem to point to the third set of premise and conclusions. They reveal that the changes in book and job printing in New York City from 1925 to 1929 were as follows:

Wage earners	+23.3
Wages	+37.3
Value added by manufacture	+65.3
Average wage per man	+11.3
Output per man	+34.1
Wage-cost per dollar of value added by manufacture	−16.9

Thus although wage earners, wages and wages per man rose from 1925 to 1929, the output per man rose almost as much as wages, and the value added by manufacture increased nearly again as much. These changes marked a 17 per cent decline in wage-cost per dollar's worth of printing with gains both to employing printer and to employee.

6. Summary

(1) Reversing the order of the topics discussed in this chapter for the purpose of summarizing the conclusions reached, it is important to point out that the basic procedure in measuring the results of technological change—that of discovering the effects upon productivity and cost of production—must be left to the future. As yet, the production of printing in its many varied forms of quantity and quality cannot be measured with accuracy. A theoretical measurement of quantity pressroom out-

put in union shops shows that a man produces more square inches of printing on the new models than on the old, and that the wage-cost per quantity unit of printing has tended to rise as a result of an increase in wages without reduction in the complement of men. This wage-cost is about three-fifths as much on the new presses as on the old, and it rose during the five-year period.

Wage-cost of quantity printing is, however, an unsatisfactory index of what the printer pays out or of what he receives. On the other hand wage-cost of all printing—quantity and quality combined—as computed for the value added by the production process, is also an unsatisfactory index because of the other factors that enter into competitive selling price.

(2) In so far as an index of machine employment could be established, it was found that the new machines are kept running more of the time than are the old machines.

(3) Part-time employment was not discovered to be a result of mechanization in six large plants in March, 1929 as compared with March, 1924 (both relatively prosperous seasons). On the contrary, pressroom workers received more full-time employment and the firms purchased more labor-hours in the later than in the earlier period. The gains in employment were greater for pressmen than for press assistants.

(4) Investigation of fifty-three pressrooms over a five-year period of mechanization revealed less net displacement of men than was anticipated. Because of the expansion of the plants, 16 per cent more men were employed in 1929 than in 1924, and there was even a slightly larger ratio of men to presses in the later period.

The changes in employment took opposite directions on the old and the new models, however—the relative number of men having slightly increased on the old models whereas on the new they declined.

These changes raise the question whether, as time passes and the semi-obsolescent machines are further replaced, there may be an appreciable decline in the number of men employed per one hundred presses.

(5) The incidence of these technological changes is found to

fall disproportionately upon pressmen and press assistants, revealing an increasing relative demand for skilled work rather than, as is perhaps more often the case, a dilution of skill. In the fifty-three shops over the five-year period, pressmen enjoyed a net gain of eight per cent in employment opportunities while press assistants suffered a net displacement of six per cent. Whereas the proportion of pressmen to assistants on the older presses was about one to two, an average of more than one pressman to each assistant formed the complement on the newer models.

(6) Thus, two currents of gradual displacement appear to have been created within the pressroom as new presses are installed and as the occupation of hand-feeding recedes into obsolescence. These are *(a)* reduction in the ratio of men to presses, and *(b)* replacement of assistants by pressmen.

(7) Just what effect these currents of displacement which were moving within the pressroom had upon the reserves of pressroom workers who waited outside for work is a highly important but entirely unknown factor. Our analysis has dealt only with *net* effects of technological change upon employment. It has given no clue to the number of *individuals* affected during the five-year period—of the proportion who could be and were transferred from old to new processes and from assistants to pressmen, of the proportion who were discharged or the proportion who, when separated from their jobs, found themselves spending an increasing amount of their work-time in the labor reserve.

These are questions of major importance in an attempt to discover the true nature and incidence of technological change. Indeed, as we look back to measure net effects upon pressroom employment against net changes in mechanical techniques, it looks as though these questions may be of more than usual importance in commercial printing. For it is manifest that the very nature of commercial printing at the present time makes it not one of those industries in which machines are rapidly and on a large scale taking the place of human labor. On the contrary, the displacement process is very gradual here—the relative demand for skilled labor grows while the demand for the semiskilled perceptibly wanes.

The following chapter will be devoted to the more intimate phases of this inquiry—to the individual cases. This will require us to enter the pressrooms themselves in order to discover at first hand what the actual shop practices are, and to interview the men concerned.

Chapter IV

DOES JOB OR PROCESS DISPLACEMENT MEAN THE DISCHARGE OF MEN?

1. Shop Practice—New Machines for Old

Picture the pressroom of Mr. C. in whose job department a pressman and three assistants are turning out theatre programs and calendars for the New Year. Each of the four men is hand-feeding a platen press—the pressman being in general charge. A salesman of the new job-automatics comes along, reminds Mr. C. that "this is the age of high-speed automatics" and induces him to trade in his platens for two job-automatics, instruction of the pressman being a part of the bargain.

This transaction causes the displacement of two or perhaps all three of the press-feeders. For, while the union agreements call for four men to operate four hand-fed platens, one pressman is permitted to run two job-automatics without an assistant if the work is plain black printing. If, however, the process includes color or half-tone illustrations, an assistant must be in attendance at one of the two machines. (This rule seems to meet the technical needs of the case for it is usually observed in open shops as well as union shops. The practice offers an interesting example of the fact that although the importance of the press assistant is waning, he is still considered necessary by employers who are union-free to do without him.)

Had Mr. C. decided to keep the four platens and equip them with automatic feeding attachments, he would have increased his output somewhat less than the two job-automatics would have done, although the three feeder-assistants would have been displaced by a second pressman.

Or, if the four hand-fed platens had been supplanted by two cylinders of the size just larger than the job-automatics which in these pages have been designated as "small cylinders," one or perhaps two of the three displaced assistants could have been transferred to them, according to whether they were the new automatic cylinders or "units," or whether they were the old hand-fed machines. That is, this would have been the case had the agreement with the assistants' union been observed. On the other hand the agreement with the pressmen's union, which conflicts with that of the assistants on this point, would permit the discharge of all three of these assistants and the employment of a second pressman instead, making a complement of one pressman to the press.

Besides replacing platen presses, automatic cylinder presses draw printing away from the larger machines in the cylinder department above them. When extreme solids are to be printed, as was explained in Chapter II, the large cylinder press, because of its weight and inking facilities is superior to the smaller automatic machine; but where solids are few it is often more economical to cut up the forms for printing on the faster and less expensive presses, even if it results in the large machine's standing idle. This probably reduces employment for the large cylinder workers (especially for feeder-assistants). For, even though more men are needed in the job department, cylinder men are not frequently transferred there in a union shop.

The case of Charles O., senior press assistant, is almost exactly in point. In 1926, the plant that employed Charles installed four new job-automatics, and, instead of keeping the hand-fed cylinders, shipped them all to their branch office in Buffalo. Thereupon the large work was cut up for the new automatic presses which employed junior assistants at a lower wage scale than Charles received. The consequence was that while he was not discharged, his work was so reduced that, ultimately, he quit.

Again, large single cylinders are threatened on the other side by the labor-saving color and perfecting presses. Here also the voice of the salesman is heard: "This is the day of color as well as of speed. Why run a sheet twice through the press when you can just as well print both colors at once?" Or, "why two runs when both sides of the sheet can be printed in one?" A pressman and two assistants had been at work on each two of the large single cylinders. And now, as one color or perfecting press is installed to replace them, one of the assistants becomes unnecessary. Or, as is often the case, if the firm decides to retain the old cylinders, shutting down one for the time being, this, too, means the dismissal of at least one of the assistants, and possibly of both. The pressman, being a key man, is retained for other presswork—on a color press, on one of the larger automatic cylinders, or on make-ready.

No written rules prevent the transfer of men from the large single cylinders to the color or perfecting presses. In the usual case the transfer is probably made. Theoretically, all pressmen should know how to blend colors and how to produce color printing. However, in not a few instances pressmen whose years of experience have made them expert in black work become technically lost in the maneuvers of the color press.

In passing, it should be said of color presses that they seem more frequently to have been *added* to the printer's equipment than to have replaced large cylinders. The demand for color seemed either to accompany or to follow increasing demand for printing, rather than to lead it. For example, in the present plant survey no instance was found in which a large cylinder was discarded to make way for a color press. The color press, for the time at least, was an addition to previous equipment.

There is no way of telling how widely this practice is followed, nor how long it will last. So far our taste for color appears to be insatiable. In fact it has recently inspired the invention and sale of small color presses which already bid fair to challenge the position of the new automatic single cylinders as well as the old. In turn, these new color presses embody one more menace to the security of press assistants. For, except for the make-ready, employers urge that they shall be operated by one man to the press, that man of course being a pressman.

When the number of identical impressions attains the 50,000 to 100,000 mark the single cylinders are nowadays left behind and the rotaries come into their own. The sheet-fed rotaries double the speed of the flat-beds and are used for the medium-length work. The web-fed rotaries at four times the flat-bed speed take over the editions of, say, 100,000 and more.

The printing of one of our best-known weekly magazines is an example of the flight from flat-bed cylinder to rotary-web press which resulted in cutting labor more than in half. Before 1910, this magazine was turned out at the rate of about 1,000 impressions an hour on each of its single-cylinder presses. Now on its mammoth, specially-designed web press, 10,000 of the 64-page books are produced in an hour. In the earlier period, it took three sets of two machines each to print the inside of 100,000 books in the short time allotted, and another set of three presses for the three-colored covers. Some fifteen men at the presses, together with those in the bindery, who folded, stitched, and trimmed, spent about 820 hours per week on this magazine—an equivalent of full employment for some seventeen or eighteen persons in each forty-eight hour week.

Now a single web press has replaced that battery of six flatbed cylinders, together with the folding, cutting, and stitching machines. It does all but print the covers and trim the books. Known everywhere by the name of the magazine it creates, this press draws endless yards of white paper into itself at the head while it disgorges at the foot 100,000 books in ten hours running time. The total number of man-hours now consumed each week is about 365—less than half the time and the number of persons that were required before. The economies, the owners say, saved the initial cost of $45,000 in three years.

In New York City where this press was first installed, a union complement of seven men was required to operate it. Outside of New York City it was and is now operated by five men. Both the press and the magazine it prints are an example of the migration from New York City which is discussed in a later chapter. Printers of editions of this magnitude are subjected not only to local competition, but, like fruit and cotton farmers, to national competition as well. Their location and the number of workers they employ are influenced by what their country-wide competitors are doing. Consequently, some of the hardest-fought battles between organized employers and organized workers in New York City have been over the complement of men on rotary presses, and what the wage shall be.

Cylinder pressmen are not necessarily displaced when rotary presses take over the work; on the contrary, the abler ones may be transferred at an increase in wage. But, in turn, when a web press is moved out of the city, the men are usually left to seek work elsewhere. This was the fate of the crew just mentioned, except for the first pressman who had made the press a part of himself and moved away with it, remaining its master for years.

Further reduction in the number of men has been accomplished on rotaries, and on the lesser presses, by improvements in the methods of making ready the forms and in guarding against blurs from fresh ink. Also the rotary-offset press which is entering the field of commercial printing, and which was briefly described in the previous pages as lithographer's equipment, is a machine which practically eliminates the make-ready work of pressmen as well as the work of the linotypist and the other mechanical typesetters.

Thus, running parallel with the possibilities of transfer of men from old to new jobs, are forces continuously at work throughout the pressroom from smallest to largest presses, toward the gradual reduction of the complement of men. These forces affect individuals here and there, but they do not usually affect many workers at one time. The migration of a firm to another city, of course, or even the merging of firms, is likely to leave a whole crew of men out of work. Mergers in commercial printing nearly always cause the loss of jobs to the workers of one or the other plant. With these two exceptions, however, the nature of this industry, requiring as it does a great deal of highly specialized labor on complicated machinery, seems to preclude swift or sweeping effects of technological change upon the men employed.

2. Shop Practice—The Processes of Attrition

The survey of 53 New York City pressrooms disclosed a net displacement of 6 assistants out of every 100 during 5 years of mechanization. For pressmen, on the other hand, there was a net gain of 8 jobs for every 100.

Revealing the trend as these findings do, they nevertheless give no information as to the number of individuals who were affected during this time. When changes in the number of workers are treated in net sums like the changes in the number of machines, they give no clue to the in-and-out employment—to whether John and Mac and Henry were retained by their foremen for work on the new processes or whether they were dismissed. This is a question of major importance in weighing the true nature and incidence of technological change. To know the net effects of improved techniques upon employment is of course essential, but only the half has been told until we ascertain what actually becomes of the persons involved, and how far adaptation of regularly-employed workers to the new techniques is economically and socially possible or practicable.

In the pages just preceding, an attempt was made to give some insight into general shop practice as changes in equipment and processes in the book and job pressroom are made. That these changes are complex and variable is clear. That men are more frequently transferred to other jobs than dismissed, seems also evident. It appears that the average pressroom is over-equipped, that there is rarely a time when all presses are being used at the same time, and that the semiobsolescent presses stand idle more than the new.

This means that the average pressroom is not completely manned, that the management depends upon outside recruits for extra work, and that the regularly employed men move about among the presses to meet the demands of the hour and the day. In the job department they move among the platens and job cylinders; in the cylinder department, among the single cylinders and the color and perfecting presses and, at times, to the rotary presses as well.

This movement among machines of the regularly-employed men is thus a characteristic of the commercial printing pressroom which is very worthy of note in a study of the technological displacement of men. Nevertheless, it greatly complicates tracing the effect upon any particular worker of the installation of any particular machine after the change has taken place. Detailed employment records are not kept. There is no way of discovering from the books why a man's name disappeared from the pay roll, or why another name appeared.

Moreover the labor turnover in the average book and job pressroom is high, particularly among the less-skilled press assistants. Although no comprehensive study of labor turnover has been made, the evidence of its existence is abundant, the causes of separation from work being both personal and managerial. For example, a coterie of self-styled "O. T. hounds" made themselves known to the writer in the early stages of this inquiry. O. T. stands for overtime, and these "hounds" explained that instead of regular employment they preferred to get three or four twelve-hour nights of work a week which paid them a sum over the basic scale and allowed the rest of the time for personal consumption.

On the employer's part, the practice of calling in extra men to operate the older presses for emergency work is of course a deep-rooted source of labor turnover. On weekly periodicals one firm customarily calls in extra men for Thursdays and Fridays, and another for the days at the end of the month for printing the monthly sheets. Practice in different offices ranges from making changes in the crew after nearly every job, to almost complete stability of employment where the workers remain in the same pressroom for ten or fifteen years. The ratio of calls for extra men is usually two assistants to one pressman, for a foreman hesitates much longer before letting a good pressman go than he does over parting with a semiskilled assistant.

Thus the pressroom force can so easily be decreased or changed in personnel through the everyday processes of attrition that the difficulties of an accurate pinning of labels to men "displaced by improved techniques" are almost insurmountable. Men may be "laid off" during a slack period and told to come back "when things pick up," thus falling into that great Class B, questionably created by the 1930 federal census of unemployment.[1] When they return, however, they may find, for example, that automatic presses stand where they left their old hand-fed machines, and that there is no longer a place for them. Sometimes a manual feeder will have learned to operate an automatic attachment during his "lay-off," and he may be rehired in the former plant at full-time or part-time work, this to be determined by the demand for his services and his ability to get on smoothly with his pressman.

There is no way of ascertaining to what extent men who have been laid off in this way, or who have quit in advance of being laid off, fail to find as much employment at their trade as they have had before. Observation and inquiry at the shops, among union officials and unemployed men, lead the writer to believe that the number of these cases, particularly among the manual feeders, has been increasing, and perhaps more especially so since 1924.

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[1] The Class B unemployed were distinguished from those in Class A because they reported themselves as having jobs from which they had been only temporarily "laid off." As the depression continued, however, these men for the most part remained as jobless as those in Class A.

Day-to-day shop practice in the commercial pressroom, therefore, rendered it extremely difficult to push the search for machine displacement of men further than the net figures. Calculation of a rate of displacement was out of the realm of possibilities, and it was also impossible to identify many of the individuals who had been dislodged. The attempt was not abandoned, however, to identify, seek out, and interview as many of these men as could be traced through the various channels that will be described. A few tabular views of changing pressrooms will aid in presenting their cases.

3. Tabular Views of Changing Pressrooms

Open Shops

Plant A, a non-union printing office, grew both in press equipment and in men employed during the five years 1924–1929. All the presses were small but the five platens were reduced to three and the two job-cylinders grew to six. The fact that removals and installations of equipment were made all in one year, and probably at about the same time (although this is not known) means that men may have been transferred instead of being discharged.

Plant A: A Medium-Size Open Shop

Winter of 1923–1924 and winter of 1928–1929.

1924 *The complement*
- 7 presses: 3 hand-fed; 4 machine-fed
  - (*a*) 5 old models: platens
  - (*b*) 2 new models: job-automatics
- 5 men: 3 pressmen; 2 assistants (1 feeder, 1 operator)

1929 *The complement*
- 9 presses: 2 hand-fed; 7 machine-fed
  - (*a*) 3 old models: platens
  - (*b*) 6 new models: 4 job-automatics, 2 small automatic cylinders
- 7 men: 4 pressmen; 3 assistants (1 feeder, 2 operators)

Chronological Changes in Press Equipment

1924-1928 No changes
1929 *Added:* 1 machine-fed platen, 2 job-automatics, 2 small automatic cylinders
Discarded: 2 machine-fed and 1 hand-fed platen

The platen presses had not been used steadily and so they were not fully manned. When two of these were removed one pressman was transferred to the job-automatics, leaving the assistant at work at his platen feed-board. Another job pressman and another assistant were added to the force.

Plant B is another open shop in which no displacement of men was evident. This firm uses large as well as small cylinders, retains its old presses and continues to have them hand-fed. The two discarded hand-fed platens had frequently been idle. Two job-automatics and a large hand-fed cylinder were installed. In 1924, one pressman fed one platen and watched another which was mechanically fed. In 1929, he with his two assistants were feeding the three remaining platens.

PLANT B: A MEDIUM-SIZE OPEN SHOP

Winter of 1923–1924 and winter of 1928–1929.

1924 *The complement*
  8 presses: 7 hand-fed; 1 machine-fed
    (*a*) 8 old models: 5 platens, 2 small hand-fed cylinders, 1 large cylinder
    (*b*) New models: None
  7 men: 2 pressmen; 5 assistants (5 feeders, no operators)

1929 *The complement*
  9 presses· 7 hand-fed; 2 machine-fed
    (*a*) 7 old models: 3 platens, 2 small hand-fed cylinders, 2 large cylinders
    (*b*) 2 new models: job-automatics
  11 men: 4 pressmen; 7 assistants (6 feeders, 1 operator)

Chronological Changes in Press Equipment

1924-1925	*Discarded:* 2 hand-fed platens
1926	*Added:* 1 job-automatic, 1 hand-fed large cylinder
1927	No changes
1928	*Added:* 1 job-automatic
1929	No changes

In the cylinder department, one pressman assisted by three hand-feeders had supervised the operation of two small and one large press. As the second large hand-fed cylinder was added in 1926, another pressman was engaged to run the two and an assistant was added—the same number of men as would have been employed had this been a closed instead of an open shop. As more work was brought to the small cylinders another pressman was taken on—again as though the plant were unionized.

Owing possibly to the greater mobility of the workers in pressrooms where union restrictions are absent, and also owing perhaps to their small size, no actual dismissal of men because of the installation of new machines or methods could be traced in any of the eight non-union offices included in this investigation. The lack of employment records of course makes impossible any absolute statement, but this omission was common to all shops investigated. It is once more noteworthy that these shops, "untrammeled" by the unions, retain so large a proportion of the older-model presses and do so much hand-feeding.

Union Shops

In the unionized pressrooms, changes occurred similar to those just described in the non-union shops. Plant X, for example, increased its presses by two and its men by three, with no displacement of workers to be discovered.

PLANT X: A MEDIUM-SIZE UNION SHOP

Winter of 1923–1924 and winter of 1928–1929.

1924 *The complement*
- 10 presses: 6 hand-fed; 4 machine-fed
  - (*a*) Old models: 6 platens
  - (*b*) New models: 4 job-automatics
- 5 men: 3 pressmen; 2 assistants (1 feeder, 1 operator)

1929 *The complement*
- 12 presses: 6 hand-fed; 6 machine-fed
  - (*a*) Old models: 6 platens
  - (*b*) New models: 4 job-automatics, 2 small automatic cylinders
- 8 men: 5 pressmen; 3 assistants (1 feeder; 2 operators)

Chronological Changes in Equipment

1924-1928	No changes
1929	*Added:* 2 small automatic cylinders

Plant Y offers an instance of known displacement of men as changes in equipment were made. Although the number of presses remained the same, their nature was so improved that three regularly-employed men were displaced. The table presents the changing picture. Not until 1929 were any presses discarded and then the number of new models exactly replaced the old. One pressman had been taken on in 1927 to operate the new job-automatics. One pressman and four feeders were dislodged in January, 1929 when the four large hand-fed cylinders were thrown into the discard. But the pressman was transferred to the two new small cylinders, installed also in January, and one of the feeders chosen because of his seniority of tenure was made an operator on these presses at an increased wage. The other three hand-feeding assistants were permanently displaced from this shop.

PLANT Y: A MEDIUM-SIZE UNION SHOP

Winter of 1923–1924 and winter of 1928–1929.

1924 *The complement*
  15 presses: 10 hand-fed; 5 machine-fed
    (*a*) 11 old models: 3 platens, 1 small hand-fed cylinder, 7 large cylinders
    (*b*) 4 new models: 1 job-automatic, 1 small automatic cylinder, 2 two-color presses
  20 men: 8 pressmen; 12 assistants (9 feeders, 3 operators)

1929 *The complement*
  15 presses: 6 hand-fed; 9 machine-fed
    (*a*) 7 old models: 3 platens, 1 small hand-fed cylinder, 3 large cylinders
    (*b*) 8 new models: 3 job-automatics, 3 small automatic cylinders, 2 two-color presses
  17 men: 8 pressmen; 9 assistants (5 feeders, 4 operators)

Chronological Changes in Press Equipment

1924-1926 No changes
1927 *Added:* 2 job-automatics
1928 No changes
1929 *Added:* 2 small automatic cylinders
  Discarded: 4 large hand-fed cylinders

Fortunately these three men could be identified for interview. It was reassuring to discover that although one became a victim of irregular employment for an indefinite time, receiving from one day's to two weeks' work at a place, the other two men bettered their status by finding regular employment in operating automatic feeders at the union scale in an open shop much nearer their homes. Their new work was for full time as compared with only three days a week while hand-feeding in the Y plant. This pushed their total earnings higher than ever before.

One of these men, George G., proved to have rather exceptional technical knowledge. Although he had been a hand-feeder he could operate all of the automatic attachments as well, and at the new job he operated a feeder on a sheet-fed rotary press. He further increased his earnings by repairing automobiles. In fact, in his own estimation at least, George was a chauffeur, a carpenter and a cement worker, in addition to his accomplishments in the printing trade. At thirty-six years of age, he owned his own home. Resourceful and enterprising he was among the highest grade of men interviewed for this study. In December, 1929, he was still steadily at work for an increased wage of $50 a week.

Plant Z is one of the few among the thirty-six union shops in which the number of presses was actually reduced. The removal of the small hand-fed cylinder and the equipping of the one large hand-fed cylinder with an automatic feeding attachment caused the dispossession of a cylinder pressman and a cylinder feeder. The other cylinder feeder became an operator. In the job department the hand-feeder also became an operator. The arrangement was for him to hand-feed the two platens whenever they were used, and at other times to be an operator on one of the new job-

Plant Z: A Medium-Size Union Shop

Winter of 1923–1924 and winter of 1928–1929.

1924 *The complement*
  10 presses: 5 hand-fed; 5 machine-fed
    (*a*) 10 old models: 5 platens, 4 large cylinders, 1 small cylinder
    (*b*) New models: none
  11 men: 5 pressmen; 6 assistants (3 feeders, 3 operators)

1929 *The complement*
  9 presses: 2 hand-fed, 7 machine-fed
    (*a*) 7 old models: 3 platens, 4 large cylinders
    (*b*) 2 new models: job-automatics
  9 men: 4 pressmen; 5 assistants (1 feeder, 4 operators)

Chronological Changes in Press Equipment

1924-1927 No changes
1928 *Added:* 2 job-automatics, 1 continuous feeder for large cylinder
  Discarded: 2 platens and 1 small hand-fed cylinder
1929 No changes

automatics. H. R., the displaced cylinder feeder, was discovered in the process of summer interviewing in the union out-of-work rooms, in 1928.

Upon receiving H.R.'s testimony the plant was visited in order to obtain the manager's explanation of the case. This proved to be an interesting example of carefully-planned reorganization of the pressroom for more efficient procedure. Three pressmen and five assistants had been employed in the cylinder department running the five presses (four large and one small). Had floor space been sufficient, the manager explained, he would have added another press so that each pressman could operate two, his quota by union agreement. For as it was, one of the pressmen was receiving full pay for operating only one press. Consequently, instead of going to the questionable expense of enlarging the floor space, the small hand-fed cylinder was discarded, making it possible for the four large cylinders, now all machine-fed, to be rearranged so that each could be equipped with automatic delivery boxes. This enabled the firm to save the wages of one pressman and one feeder-assistant at the same time practically to maintain the former output, according to the manager. Loath to dismiss the two men who had been employed steadily for three years, the firm had planned to "slide the men" and give all of them some employment. H. R., in the interview, had also mentioned this arrangement but said he thought it unfair to the other men, and therefore he had quit.

The manager of Plant Z considered it much more desirable economically to use his equipment day and night when necessary, instead of enlarging the producing capacity. He volunteered the conviction that New York City print shops are over-machined, that firms too often yield to the importunities of manufacturers' salesmen and purchase new equipment on the installment plan when they receive substantial new orders for printing. In time, he explained, orders may shrink and presses stand idle as depreciation sets in although purchase payments are still to be paid.

H. R. had worked in the Z plant before. He was a man, forty-six years of age, who had been a member of his union for twenty years. During this time he had spent three disastrous years trying out printing for himself. But, sadder and wiser, he had returned to press-feeding. When asked after this displacement whether he had enough savings to live on until he could find another job, his wan reply was, "Yes, if I don't live too long." He had no employment for two weeks. Then he found irregular jobs. A year later an attempt was made to find him by urgent letter, but no response came.

Plants X, Y and Z will suffice to convey an idea of the changes made in the entire group of thirty-six medium-size union plants during the five-year period. As far as could be discovered, a total of forty-two assistants and eleven pressmen lost their jobs in these shops during this time. Four plants, of which Z is an example, reduced the number of presses on their floors; in nine the number remained the same, as was the case in Plant Y; and in the remaining twenty-three, the number of presses was increased as in Plant X. In no year were presses discarded, unless they had been standing idle, without being replaced by other presses. Nevertheless, for the most part changes could only be ascertained by years and not by exact dates. This necessarily blurs the outlines of the tabular views. But in the union shops, as in the non-union shops, it looks on the whole as though there had been a rather high degree of synchronism between the removal and the installation of presses. Conscious planning of this kind would, of course, be necessary in a busy pressroom where productive power must be held in readiness for the execution of orders. It is possible, however, that synchronism may have been planned not without the desire to dismiss as few regularly-employed men as possible.

In the large union pressrooms the difficulties of tracing displacements of men were even greater than in the smaller plants. Not only were there no employment records, but no reliance could be placed on the memory of foremen and their associates where so many men were at work. Although no displaced men could be identified in these nine large pressrooms, it is fair to suppose that, as in the smaller shops, some were let out when technical changes occurred.

In Plant G, where forty men were employed at twenty-five machines, is to be seen a pressroom in which all groups of presses are in use—platens, cylinders, rotaries. Nine more men were employed in 1929 than in 1924, as four presses were added. However, in this establishment the removals and installations of presses were not even synchronized by years. The result appears to be that while eight new pressmen and seven new assistants were added to the force, at least two pressmen and four assistants were dislodged, either quitting their work or being discharged.

Plant G: A Large Union Pressroom

Winter of 1923–1924 and winter of 1928–1929.

1924 *The complement*
  25 presses: 3 hand-fed, 22 machine-fed
    (*a*) 12 old models: 3 platens, 1 small cylinder, 8 large cylinders
    (*b*) 13 new models: 2 job-automatics, 9 two-color cylinders, 2 web-fed rotaries
  40 men: 20 pressmen; 20 assistants (2 feeders, 18 operators)
1929 *The complement*
  29 presses: 2 hand-fed, 27 machine-fed
    (*a*) 9 old models: 3 platens, 6 large cylinders
    (*b*) 20 new models: 1 job-automatic, 5 small automatic cylinders, 5 two-color cylinders, 6 perfectors, 3 web-fed rotaries
  49 men: 26 pressmen; 23 assistants (2 feeders, 21 operators)

Chronological Changes in Press Equipment

1924 No changes
1925 *Added:* 2 small automatic cylinders, 1 web-fed rotary (no color or bindery attachment)
1926 *Discarded:* 1 small and 2 large hand-fed cylinders
1927 *Added:* 1 job-automatic
  Discarded: 1 web-fed rotary (color and bindery attachments had not been used)
1928 *Added:* 3 small automatic cylinders, 2 large machine-fed two-color cylinders, 1 large machine-fed perfecting cylinder, 1 web-fed rotary (no color or bindery attachment)
  Discarded: 2 small automatic cylinders, 2 machine-fed two-color presses
1929 *Added:* 1 large machine-fed perfector

In another large plant which may be called "H," in which the number of presses was increased from thirty-three to thirty-seven, again no dismissals of men could be traced through the plant survey. But again, among the men interviewed by the writer in the union out-of-work rooms in 1928, two assistants separately said they had been "laid off" by this firm when new presses were installed. One of these admitted that he had had some trouble with his foreman and that he quit hastily without realizing how hard it would be to get another job.

In June, 1929, therefore, the plant investigator was asked to search further for the true stories of these two men. He reported:

> I made inquiry, as you requested me, in regard to the claim of the cylinder feeder, J.R.S.'s being laid off. Mr. —, the foreman, told me that S— was let go because he was inattentive to his work and generally dumb. He said S— was both a hand and automatic feeder. Apparently he is not a mechanization case. I also made inquiry about S.S., platen feeder and assistant on two job-automatics. The foreman said S.S. was inclined to be radical, and he was late in getting to work in the morning. I visited S.S. and without knowing it he confirmed what Mr. — had told me, adding that he was a platen hand and automatic feeder, and that when the job-automatics were put in he was given a chance to work on them, that he had been late on several occasions, and that Mr. — was too strict and called him down, whereupon he quit. His general complaint is that he does not get a square deal in any shop. It was very plain to me that he was not a mechanization case.

It was not usually possible nor expedient to check up on the testimony of the men, but it is interesting to note that in the two instances where this was done, one firm, Plant Z, in general corroborated what the man had said about his dis-employment, and the other, Plant H, convincingly denied the men's versions.

Displacement of men, as has been explained, is not always due to changes in presses and feeding equipment, but to changes in other techniques as well. For example, Plant I, in addition to raising the number of presses from thirty to thirty-nine, altered the method of printing on the web-fed rotary presses. According to custom in high-grade printing, this firm had been using an offset-roll on each of these presses from which a sort of blotting paper runs along with the freshly-printed continuous sheet to save it from blots and smears. An extra pressman (tension man) is employed in New York union shops when an offset-roll is used. In this plant the offset-rolls on three web presses were replaced by carborundum top-sheets which did the blotting without the assistance of the tension men. Consequently, the jobs of three men who had been employed eleven years in this plant disappeared.[2]

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[2] The old process of slipping sheets of porous paper by hand between each printed sheet as it came off the press to avoid the blurring of fresh ink on high grade paper has largely disappeared. This work was performed sometimes by the pressman, sometimes by a press-feeder who was unoccupied while his press was not running, sometimes by a boy. Doubtless a good many boys have been displaced by the adoption of new processes for drying the sheets—in many cases by a gas flame that plays over the sheet as it is delivered and in other cases by a paraffine-spraying attachment.

Two of these three were retained by the firm.[3] One of them became, at least temporarily, an extra pressman for making ready the presses, with no reduction of wage scale. The other, after deciding to demote himself by transferring his union membership from the pressmen's union back to the assistants' union whence he had come, was given a job as assistant at a sacrifice of $7.50 weekly in his basic wage scale. His work was distributed among several presses and included both hand and mechanical feeding. This man was also a licensed chauffeur and sold real estate on the side. He was prominent in city politics as well, and declared himself to be a fire commissioner.

The third of these pressmen in Plant I was discharged. He was unemployed for a month. But, having anticipated what came, he had attended the pressmen's school and familiarized himself with the new job-automatic presses, so that by the end of the month he was taken on permanently in another plant to operate two job-automatics at $56.00 a week. This was $6.00 more than he had earned on the web press. This man also held a chauffeur's license.

4. Looking for a Job

There are several channels through which a pressroom worker looks for a job. If he is aggressive and restless, or if he dislikes the passive sociability of the out-of-work rooms, he frequently presents himself in person from one pressroom door to another where he has worked before, or where his friends are working. If he has a "pull" with a foreman, he will be notified when there is work. An unknown number of men obtain their employment in this way, never depending upon the out-of-work rooms which they more or less scorn.

Not a few foremen, likewise, avoid calling for men at the out-of-work rooms, preferring to make up their own list from those who have come to see them. These foremen say that the union out-of-work rooms have proved unsatisfactory in filling their calls for men, that the rule of sending the man whose name heads the waiting list means that insufficient attention is given to the nature of the job to be filled. The result may be either friction with the foreman or actual spoilage of work.

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[3] It seems that the retention of these men did not, in turn, cause the displacement of other regularly employed men, but presumably the shop thereafter made fewer calls for extra workers than before.

Some employers resort to the advertising columns of the newspapers in filling their needs for workers. In more normal times there is scarcely a day when a list of opportunities for pressmen (less frequently for press assistants) does not appear in the "help wanted" columns of the large New York City daily papers.

Nevertheless, the more obvious way of looking for a job, at least from the investigator's point of view, is that of enrolling at the out-of-work rooms. The pressroom unions separately maintain this service for their members. Organized employing printers also conduct an employment agency, registering all applicants, union or non-union, who care to come and wait for calls.

The testimony of those in charge of these employment centers is, however, that the workers who come are pretty largely those who form the pressroom labor reserve, men whose faces are to be found there from week to week, and often from year to year. These workers decry the methods of the more independent job seekers. One well-groomed Irishman of principles said, "We don't go 'round looking for a job; it don't look good on the face of it, when you belong to a union. Most of us don't do that. It's unfair to other people on the list." But this regard for the dignity of the union frequently proved to be a self-justification for lack of initiative. "This business gets you so," the Irishman continued, "when you do get a job you have no ambition to work."

5. Search for Victims of Technological Unemployment

All of the known sources of information were tapped in the search for pressroom workers who had been displaced by improved machinery or managerial technique. Pressmen were included, but the search was especially directed toward press assistants because of the vestigial character of their occupation. The difficulties encountered were many, for neither the firms nor the unions could direct the writer to as many as a half dozen cases where men had actually been displaced by machines. Unemployed men when interviewed could by no means be relied upon to know the real cause of their joblessness. Employers, usually thinking of the number of men they employed rather than of any particular individuals, more often than not objected to the implication that the new machines had taken work from men. Their rejoinder was that machines had brought more printing and therefore more employment, a trend which we have seen was thus far true on the whole. The unions, on the other hand, did not hesitate to charge the machines with a full measure of responsibility for unemployment. The officers of the press assistants' union were frankly anxious about what the future would bring. Their solicitude made them especially coöperative during the promotion of the investigation.

Consequently, when it was decided to circularize the entire membership of the local assistants' union, which consisted of 2,400 men and one woman, the letter went out on union stationery addressed to "Dear Sir and Brother" and signed by the president, "Fraternally yours." The letter, reproduced on page 238, asked simple questions as to whether the member had lost any job during the last five years when new presses or feeding attachments were installed in his plant. It contained a business reply envelope addressed to the director of the inquiry.

Despite great care in the planning of this exchange of correspondence, only 120 men out of the whole 2,400 replied to these letters—a mere five per cent. Of those who replied, 45 alleged that they had been displaced by improved machinery; 24 of these had been thrown out of work in consequence, while 21 said they had been transferred to new jobs within the same plant.

It seems fairly certain that this meager harvest of replies to the letter failed by a good deal to reveal all of the facts. The study of 53 plants alone gave evidence of more displacement than this, and there were hundreds of other shops in which technological changes were taking place.

Inquiry proved that the reasons for the failure to respond to the letter were various. About 50 envelopes were returned undelivered, and probably others did not reach the addresses; but inertia may well have been the principal cause. Moreover, in some known cases the assistant had not grasped the idea that he was supposed to mark crosses in the squares opposite the questions and drop the self-addressed and stamped envelope into the post box. There were other members of the union who were unable to banish the fear that their replies would in some way hurt them. This was also evident in some hit-and-miss interviewing conducted at the out-of-work rooms, although it was done one case at a time behind closed doors.

From this time on in the progress of this inquiry it became clear that no quantitative study could be made of men technologically displaced. Consequently, efforts were centered upon gathering a few cases which could be analyzed as suggestive rather than fully descriptive of what was going on.

And so, complementary to the circular letters and to private interviews snatched from the ranks of the jobless, a good deal of time was spent at the union headquarters with the officers and with the men. At a regular monthly meeting of the chapel chairmen of the assistants' union, the writer, introduced by the president of the union, explained the nature of the inquiry and appealed for personal coöperation in allocating cases of displacement. Every union pressroom in the city has its chapel chairman and the president felt confident that each would know such facts about his men.

The response from the floor of this meeting was memorable. It was valuable and well meant, and it revealed many things other than cases of technological displacement, but of these it yielded just two! Men who seemed to want to give information whether or not they really had it to give, were inclined to be evasive, either for their own sakes or for the sake of the man involved. For assistants usually look forward to returning to any pressroom in which they have been employed, and this diffused aspiration tends to seal their lips when mention of one of their shops is made.

6. What the Interviews Disclosed

As the names of workers who were thought to have been technologically displaced were collected from the various sources just described, the men were formally interviewed. The interviews were held either at the man's home or at the union headquarters—never at, or near, the place of employment.

The schedule of inquiry[4] used had been previously tested and revised in order that salient facts could be noted with precision. It was necessary to know where the man had worked at the time of his displacement, what his work had been, and what was the nature of the change that eliminated his job. It was desirable to know how long he had been employed at this plant, and whether he was a steady worker here and in general. How long was he unemployed (1) before he got another job, temporary or permanent, (2) another permanent job of any kind, (3) a job in printing, (4) a job out of printing? What other kinds of work could he do to earn a living? What was his family status? What financial obligations did he have and how were they met? Did the wife have to seek remunerative work; did the children? What about installment payments and life insurance premiums? Did he have to borrow?

All told about 100 pressmen and press assistants were personally interviewed at length during the course of this research. Twenty-seven of these had been dislodged by changes in techniques, of whom six had been transferred to new jobs in the same plant with no loss of time. Fourteen men had been discharged, three had quit in anticipation of the change, and four had left thereafter because their working time had been so much reduced. For the most part the group of twenty-seven was composed of press assistants. However, six of them were border-line cases—men who had gone from assistants' to pressmen's union and back again, or who were assistants doing pressmen's work in open shops.

The changes in the occupations of these men after their displacement are worthy of note. When displaced they were composed of:

16	cylinder hand-feeders	(3 of whom could operate automatic attachments as well)
9	job-press hand-feeders	
1	tension-man (pressman)	
1	operator	
27		

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[4] The schedule is reproduced in Exhibit 11, Appendix B, p. 241.

At the time of the interviews—from a day to four years after the dislodging change had occurred—these men had become:

7 cylinder hand-feeders (4 of whom could also operate automatic attachments)
1 job-press hand-feeder
4 cylinder operators
1 two-color press operator
1 operator on a sheet-fed rotary
1 cylinder pressman working in an open shop
12 unemployed
27

Thus, although twelve were unemployed at the time of the interviews, the others had rather largely adapted themselves to the new techniques. Twenty-five of the twenty-seven were hand-feeders when displaced and only three of them could operate the automatic feeders. At the time of the interviews only seven of the fifteen were hand-feeding and four of these were operating as well. Of the fifteen employed men, ten reported an increase in weekly earnings over those received at the old jobs, three were earning less, and two just the same as before.

The time that elapsed between displacement and the first subsequent job varied from no lost time to more than seven months. The men could not always remember these important details with certainty, so that their testimony was at times unconvincing to the interviewer. In any case, there was no ultimate way of testing the exactness of what the men said. One troubled Hungarian, with a hovering though sensible wife, spoke almost no English and was deaf. He was one of the several for whom no satisfactory information could be recorded as to the length of his unemployment before the first job. Others gave estimates that seemed too inexact to be recorded. Nine men said they had suffered no unemployment, seven had been idle less than one month before securing work.

But of course these first jobs may or may not have been permanent. Two men, after less than a month's idleness, secured employment for one to two months, three for three to five months, and two for six to eight months. Seven men, up to the time of the interview, had not yet found regular work. One man had been taken on at innumerable jobs of varying duration in the four years since his displacement. Two men waited less than three months for permanent jobs, while three men waited from one to three years.

Of the twenty-two men who replied to the follow-up questions sent in December, 1929, six or seven months after the interview, eight were unemployed, although December is usually a busy month. Eight reported steady jobs, six had only part-time work. Five men had worked for from five to ten weeks out of some thirty since the interview in May or June; five had worked between eleven and twenty weeks, and twelve from twenty-one to thirty weeks or practically all the time. Of the fourteen employed men, ten were receiving higher wages than at the time of the interview.

Thus, although more than half of the twenty-seven men appeared to have benefited by the change, either in occupational status or in wages or both, their testimonies on the whole, whether or not it was a result of technological displacement, indicated a substantial increase in the irregularity of employment since the removal from their former occupations.

That these men were not by nature unsteady workers seemed rather certain from a study of the interviewers' records. Although nine had received less than full-time employment, each of the twenty-seven men had worked at least as long as two years in one printing office. Eighteen had worked consecutively for a minimum of five years in the shops where the change that displaced them occurred. Ten had worked ten years or more in one place. No one of these men had been in the printing trade less than seven years, and the average tenure for the group was twenty-three years. All but five were union men, and with one exception they had been members of their union for from seven to thirty-five years, the average length of time being nineteen years.

This brings us to the question of age which appears to have been an important factor in this sample of technologically displaced men. The average age of the twenty-seven men was forty-one years. Six were less than thirty, nine were over forty-five and four were fifty-five or more. "Forty-five is the deadline" said several of the men interviewed. "If you're over that, you can't get much in this business, only odd jobs and night work." "Some firms won't hire a man over forty-five," another said, "it's the younger element what gets the cream of it; the old fellers get only night work." (He said he was fifty.)

Timidity or reluctance to learn the new processes was confessed by several of the older men. "I haven't got confidence," said a fairly literate German-American hand-feeder. "I'm afraid to take a chance on a Dexter [an automatic feeder]—I don't know how to set it." Although this man had been in the industry thirty-two years, a union member for twenty-nine years, he said he did not know "where to go to learn" the new machines. Another, when urged by the interviewer to learn to operate the automatic feeders, said resignedly, "I'm an old-timer —an old-fashioned worker. That's for the boys." This fear of the new machines was sometimes disguised by loyalty to the older process. "Hand-feeding is not so dirty; the wash-up is worse on automatics," said a fifty-two-year-old hand-feeder who had himself transferred back to hand-feeding after a two-months' trial on the automatic press. "I was afraid I'd lose my skill as a hand feeder!" A very real fear possessed one of the men that hand-feeding jobs would disappear, forcing him to learn the new work. Despairingly he exclaimed, "I'll have to go to the — School. That's what it will come to."

The family status of the displaced men was one of the less difficult subjects of inquiry; much less so than the financial status. Sixteen of the twenty-seven men were married and living with their wives; one was a widower, and ten were single. Twelve had children, seventeen had dependents for whose support they were entirely responsible and seven of these had other partial dependents. Four had partial dependents only.

As for financial worries, sixteen out of the twenty-seven said they had received financial aid and in one-half of the cases this came from family or friends. Twelve had small savings that tided them over, with the exercise of economy. Tributes to wives were expressed by a few. "Owing to my thrifty wife, we could just make it go with the little savings until I got a job," and "the wife managed to have a little bank account. She's very careful." Three men had been forced to ask for credit from the local tradespeople or the landlord. One man's wife discontinued having work done on her teeth. Two wives went to work when the husbands lost their jobs. One man was obliged to take his young daughter out of school and put her to work. Four said they had insurance policies upon which they could borrow but none had used this source of income so far. In several instances the men had to meet installment payments on furniture, automobile, or insurance during their unemployment.

7. A Few Case Histories

Clearly, no generalizations can be made from these twenty-seven cases of displacement as to the way all workers are affected by the use of improved machines. For this reason it seems worth while and even important to know as much as we can about the experiences of these individual pressroom workers. At the risk of partial repetition, therefore, a few of the case histories will be told. It must be kept in mind, however, that the stories were the testimonies of the men themselves—the facts of the changes and their consequences, and the interpretation as to why, how and when they occurred. Nevertheless, the information was given in good spirit by the men, in many cases at their homes, and was often corroborated by their wives or some other member of the family; and, unless it was reasonably 'convincing to the interviewer after a good many cross-questions, it was not included among the case reports. Also, wherever possible, confirmation or rejection of the statements of the men was obtained from other sources. With these warnings, the condensed stories are presented believing that they reflect with a substantial amount of truth what occurred.

W. J. D., age fifty-two, was an exception among press assistants in that he had left the printing trade after seven years to be a clerk in an insurance office where he was employed for fifteen years. He returned in 1920, lured by the high wage scales. He was unmarried, had no dependents and at the time of the interview he was living by himself in a furnished room.

Between 1922 and 1925, W. J. D. was for two and one half years a platen hand-feeder in an open shop where he regularly earned from $23 to $25 a week. After his first year of this work the firm installed two job-automatics and equipped two large cylinders with automatic feeders. A demonstrator taught the pressmen how to operate the new machines and the pressmen "broke in" the assistants. W. J. D. was transferred to the automatic process but soon he asked to be put back to hand-feeding because he was "afraid he would lose his skill as a hand-feeder." It was he who preferred hand-feeding "because the wash-up is not so dirty as on the automatics."

Supplementary inquiry six months later found W. J. D. employed as a hand-feeder and also helping to operate a job-cylinder press. He was still working steadily at $27 a week.

A. E. stated his age to be forty-seven but he appeared to be more than fifty. For a year and a half he had been employed steadily at $32 a week as platen hand-feeder. In April, 1928, the firm replaced two platens with a job-automatic and discharged A. E. and one other man. A. E. resented his dismissal on three grounds: First, because he was the shop chairman for the assistants and should therefore, according to union rules, have been the last man to be dismissed. Second, because the son of the foreman, a deaf mute, had been retained in his stead. Third, because of the manner in which he was dismissed. With no warning, he was told, upon the arrival of the new press, to stop his platen and leave it even though there were sheets on the board to be fed.

A. E. was out of work only two weeks, but the new job that he found also lasted only two weeks. Subsequent jobs were of short duration. When interviews for this inquiry were being made in the summer of 1928 and 1929, he was reporting at the union out-of-work room and getting two or three days' work a week "on and off." This temporary employment for more than a year was netting him "just enough to get along." He was living with his brother and sister and had no dependents. While he was able to operate an automatic cylinder, he felt old and timid about it. He called himself an "old timer," and was fairly resigned to the belief that the "younger element get the cream of it"—the more steady jobs. He had once been the driver of a horse-drawn truck, but his health no longer permitted work in the rough weather. A press assistant ever since, he knew no other way of earning a living.

J. N., age forty-three, had been a piano teacher with ten pupils and had played in small moving-picture houses. Before he came to the pressroom he had been displaced by the "talkies." For six years before 1925 he had been a cylinder hand-feeder, steadily employed except for the slack summer months of July and August. In April the firm installed a job-automatic. J. N.'s work was gradually transferred to the new little press and at the end of June he was dismissed. His hand-fed press and two others were left standing idle.

J. N. considered himself a victim of foreman partiality, being the only man to be "thrown out." He was not given an opportunity to operate although he had some time past been an operator on a sheet-fed rotary. The foreman was vice-president of the firm. Nine weeks of unemployment followed J. N.'s dismissal during which time all savings were exhausted. He had an endowment policy but did not have to draw upon it. Although the three children were below working age, the wife earned money at home by tinting cards for the market. After about five months he secured a steady job hand-feeding a cylinder press. This was his occupation when interviewed both in the summer of 1929 and in the following December. He was receiving $45.50 per week, $3.00 more than in 1925 owing to a general increase in the union scale. Otherwise his status was neither lower nor higher than before his displacement, except for his progressive insecurity as a hand-feeder.

L. P. was a hale man of sixty-three who had been thirty-three years in the printing trade, with some half dozen intermissions during which he turned to salesmanship. He had now been working four years in one plant as a cylinder hand-feeder. Then came a new automatically equipped cylinder to replace two hand-fed presses. L. P. was given an opportunity to operate the automatic feeder but he "couldn't bluff it"—a unique admission.

As his work since the change was so intermittent, L. P. considered that he had been out of employment for four years. He "got along" by dint of careful saving of the proceeds of each intermittent day's work. The plants wanted operators and not hand-feeders and so when he got a job it was only for a time, until an operator could be secured. L. P. was receiving the union out-of-work benefit at the time of the summer interview. As a sixty-year-old member in good standing, having been in the industry for at least twenty years, he qualified as a pensioner, and was receiving $4.00 a week from the union. December, 1929 found him still unemployed. During the preceding four weeks he had worked only two and a half days. In the entire interval of six months between interview and follow-up inquiry, he had worked six or seven weeks.

P. L., age fifty-five, had a record for steadiness, having been employed for eight years in one printing office and nine in another. For twelve years he had been a newspaper pressman. As a book and job tension-man and brakeman he had been a member of New York Pressman's Union No. 51, but in 1923 he transferred to the assistants' union, hand-feeding a cylinder for the most part, but at times operating an automatic feeder. The firm took out the continuous feeder which P. L. knew best, and installed a pile-feeder in its place. This change gave the foreman an opportunity to take on a friend who was supposed to understand the pile-feeder better. P. L. was given less and less work until he quit.

After the loss of his job P. L. was out of work for six or seven months. Although two of his children were working, and a married daughter made occasional contributions, he was obliged to borrow from friends and to obtain credit from the local stores. At one time when rheumatism prevented him from working, he received a $50.00 sick benefit from the union. He thought he had worked about two weeks out of every month since his displacement, and at the time of the interview he was hand-feeding a cylinder press, which occupation he preferred. He considered it too much work and too much responsibility to be a pressman. On the other hand, when the writer called at his home near Coney Island in the summer of 1929, he was summoned from his back yard where chickens and vegetables were thriving under his devoted hand. Six and one-half months later he was still without a pressroom job and had held one only nine of the twenty-six weeks.

Age fifty, F. L. had decided that his arms were too short to work on a press with a continuous feeder. He had been hand-feeding a cylinder, but when the automatic attachment was installed he didn't know how to set it and he didn't know where to learn. His foreman did not teach him, but hired an operator instead. "I haven't any confidence," he said. "I'm too old to get jobs. Some firms won't have men over forty-five—it's the old fellers who get the night work." He wanted to get a job as janitor—an occupation he had followed before, when out of work as a press assistant.

F. L. was a widower living with his old mother who managed to save against the weeks of forced idleness, and to pay the $1.00 weekly premium on her son's life insurance. Once in a while when he was "up against it" he got "a little from the boys" or asked the landlord to wait for the rent. F. L. kept a tidy diary of his numerous jobs. It showed that he had worked at hand-feeding fourteen of the thirty weeks between summer and December, 1929.

C. de L. was one of the younger men—age twenty-six and single, living with father and mother whom he wholly supported. He had been four years a cylinder hand-feeder, earning regularly the union scale, then $45.50 a week. Two automatic cylinders were installed to replace the older models, C. de L. was taught the new process and was transferred to it with no loss of time. At the time of the interview which was three weeks following the change, C. de L. with his pressman was operating the two new cylinders, at a wage of $4.00 over what he had received before. The change had been a distinct advancement.

B. G., twenty-seven years of age and unmarried, was employed only two weeks when his firm installed a job automatic in place of three platens which he and his pressman hand-fed. The pressman took over the job-automatic and B. G. was let out. He found another job at once and at the rate of $32.00 which he had previously earned, but this, too, lasted only two weeks. Although a union man, he worked in open shops most of the time. In one place, as an assistant he learned how to operate a job-automatic, and in another he got $35 and $40 doing pressman's work on a job-automatic. He said he learned how to do this from studying a book. B. G. carried a $5,000 twenty-year endowment policy on which he could borrow when necessary, and he also had savings in the bank. He was earning $45.00 a week as pressman in an open shop at the time of the interview, which was held in his highly-varnished bachelor apartment occupied also by a brother.

J. G., age twenty-seven, was a non-union platen hand-feeder whose history revealed a range of occupations that would have been impossible in a union shop. After five years of hand-feeding his platen, the firm offered him an assistant pressmanship on the hand-fed platens. When, early in 1929, a half dozen platen-automatics were installed, J. G. was asked to work on these presses as both pressman and feeder, with a boy to help him. However, his performance was not sufficiently satisfactory to his employer to warrant the $4.00 increase in wage which he requested. The firm was willing to pay $40.00 instead of the $38.00 he was receiving, but not $42.00. Whereupon J. G. quit. He was out of work when interviewed, and was wishing for capital enough to buy two small automatic presses so that he could go into business for himself. He was unmarried and had some savings. Inquiry after six months had elapsed brought the news of J. G.'s journey to Italy and his return with a new wife. He was then both operating an automatic cylinder and doing hand-composition in an open shop at $40.00 a week.

C. B. P., age thirty, became a part-time worker as a result of the technological changes in his plant. Up to 1927 he worked five days a week as operator of the automatic feeder on a sheet-fed rotary press. That year the firm introduced several large web presses and a two-color sheet-fed rotary. These rapid printing presses sapped so much of the work from C.B.P.'s machine, which was equipped only for black printing, that his work was first reduced to four days a week, and then to only one or two. Consequently, after three and one-half years in this pressroom he quit and was unemployed for two months. C. B. P. had no children but he supported his wife and his mother-in-law. He had savings to use until he secured his next job as operator on a cylinder press where he had been at work three months when interviewed. Six months later he was again jobless, but since the summer interview he had been employed for all but four of the twenty-five weeks. He was also a licensed chauffeur.

8. Alternative Occupations

These cases, in so far as their accuracy can be accepted, reveal technologically displaced men as individuals rather than as statistical groups. When employment was broken off by the introduction of new machines, whether the discharge was technically necessary or whether it was by the prejudiced ruling of an inferior foreman, we find men struggling with unequal ability and opportunity to make their economic and social readjustments.

Usually pressroom workers, old or young, who have been dislodged from their occupations, prefer to return to the pressroom. The reluctance of the older men to work out of their occupational grooves, whether because they are too weary or too accomplished, renders them less adaptable to change in the shop practice of today than are the younger men who, at times possibly only for the sake of variety, drop quite naturally into the newly-created jobs. Moreover, many pressroom workers know no other way to earn a living than at their printing presses. Displacement for them is more serious than for those whose avocations can be brought into greater use.

The alternative to pressroom work most frequently given by the men interviewed was that of being chauffeur or mechanic. A few had their eyes on motion-picture operating. Some could do carpentry and cement work. One man had been a trolley-car conductor and another was a push-cart merchant when unemployed. There were several who had had experience as salesmen, varying from brushes to real estate, and they thought they could return to this work if necessary. Bootlegging emerged as a possible alternative for earning a living. A number of the younger men could put their musical abilities to work; in fact, one press-feeder was giving piano lessons to a number of paying students. Another, who was interviewed at the Hotel Claridge, had his studio apartment near, where he taught dancing and coached himself as an entertainer. Another, who called himself

"Melody," sang at parties for $6.00 a night and yearned for the footlights.

The occupations of policemen and firemen have proved to be congenial to press assistants. The habits which these posts develop are like those of the operating assistants in some ways—*i.e.*, spurts of work with intermittent periods of leisure in which sociability is possible, with a chance to bet on the races or to work out a crossword puzzle. In contrast to these more inviting avenues of reabsorption, a group of jobless press assistants, through the agency of an officer of their union, were once taken on in a brewery. They remained there only a few hours, declaring the work the hardest they had ever encountered.

9. Summary

To sum up briefly what this chapter has unfolded in continuation of the findings set forth in Chapter III, it is clear that technological changes in commercial printing are numerous and universal, and that they do not fail to take their toll of employment from the workers. Although only twenty-seven displacement cases could be identified for interview, their stories—some of long unemployment and others of none—are suggestive of the nature of an unknown number of other cases of men displaced during the five-year period, if all could have been found.

Nevertheless, technical improvements have had a lesser revolutionary effect on the workers of the printing industry than upon others who have been referred to in the early pages of this book—upon musicians, for example, who have been displaced by recorded music and upon telegraphers who have suffered by reason of the introduction of the printing telegraph. Changes in the pressroom, as compared with sharp disruptions of custom such as those sustained by musicians and telegraphers, are neither swift nor sweeping. On the contrary, old presses are rather steadily displaced by new presses, and this occurs synchronously with the changing character of orders received day after day. Moreover the machinery is complicated and requires a great deal of human labor with an increasing proportion of skill. Consequently the resulting displacement of men is customarily gradual, and provides opportunities for a great deal of transferring and some promotion instead of dismissal. Furthermore, since printing so far has been an expanding industry, the processes of attrition have tended to absorb an excess of workers in any particular plant when new machines were introduced.

It seems important to point out, however, that these very processes of attrition, which undoubtedly settle many of the immediate employment problems within any given pressroom and modify the traceable effects of technological change, may have contributed to a labor reserve of old-fashioned workers which has been gradually growing larger. Pressrooms are normally over-equipped, and intermittent calls for extra men to operate idle presses supply hope to displaced men that keeps them from leaving the trade.

The conditions in commercial printing which have been described in this chapter seem to offer a field for industrial planning in order to make sure that the relatively good record of the past may be maintained, that the displacing process may proceed with as little suffering as possible. Provided the industry continues to expand and to take up the slack in employment created by the new techniques, the task of avoiding dismissal of men would seem to be largely an educational problem. That is to say, it looks as though steps could be taken both by unions and by employers to make certain that pressroom workers receive training which will make them as adaptable as possible, so that they can be absorbed by new occupations as the changes occur. After what has been said of the lack of ambition of pressroom assistants as compared with the greater enterprise of pressmen it would seem inevitable, however, that the assistants must suffer more from technological change. Here, then, we seem to have a clearly-indicated need not only of a coördinated system of labor exchanges but also of adult education.

PART TWO

ORGANIZED LABOR AND TECHNOLOGICAL CHANGE

CHAPTER V

SOME COMPARISONS BETWEEN UNION AND NON-UNION SHOPS

Little has been said thus far about the part that the unions play in the process of mechanizing the pressroom in which human adjustments must continually be made. That there were strong vibrations of action and reaction between organized workers and changing technology was obvious at every turn in this inquiry. The International Printing Pressmen and Assistants' Union of North America with its strongest branches in New York City is one of the important affiliates of the American Federation of Labor, and it has by no means been dormant during the mechanization period of the last quarter century.

The subsequent chapters will be devoted to the story of collective bargaining as it has been influenced by mechanical inventions through the years of expanding use of the printed word. In the present chapter some of the objective evidences found in union and in non-union pressrooms may be weighed in so far as the limits of this inquiry have permitted them to be gathered. By a *union shop* is meant throughout this discussion one which is operated under a functioning agreement with a union or, in the absence of such agreement, a plant in which the union definitely controls the working conditions. A *non-union shop*, on the other hand, may be an open shop in which union and non-union men are employed without discrimination, or it may be a plant which is closed to the union. The essential criterion of a non-union shop in this sense is that it is not operated under agreement with the union nor are working conditions subject to union control.

1. THE MIGRATION OF PRINTING

The dominating character of the pressroom unions in New York City as compared with their lack of strength elsewhere has been the basis for ever-new threats on the part of employing printers to fold up their printing tents and steal away. The high wages paid to pressroom workers in New York as compared with Chicago and elsewhere, the shorter working week in New York and the larger complement of men required to run the presses, are frequently the declared causes of the departures from New York City that have already been made. And the fear of diminishing employment opportunities in New York as a result of migration has, at times, tended to modify the program of the unions as well as to influence the decision of the arbitrator when employers and workers could not agree.

For it is true that dozens of large publications which once were produced in New York City are now printed elsewhere. *The Encyclopaedia Britannica* is a single outstanding example. *Harvard Classics* is another. The first 50,000 copies of Wells' *Outline of History* were printed in New York City on a press newly installed for the purpose, but the order for the second 50,000 was lost to an out-of-town competitor. In arbitration proceedings in 1929, the New York closed-shop employers attested that "over 180,000,000 copies of magazines annually have gone out of New York City, most of them to non-union plants operating at lower wages and on a forty-eight hour week basis."[1] They stated that the — — is the only "really large" nationally-circulated magazine which is left in New York City. *Colliers'*, *Cosmopolitan*, *Delineator*, *Good Housekeeping*, *McCall's* and one half of the *Pictorial Review* are a few of those listed as having gone—some to Chicago, others to places nearer New York.

Commercial printing migrates like any other made-to-order product as buyers cast about for the lowest bidders, or as producers gather sufficient hope of bettering themselves. At times, single presses designed for printing specific publications are transplanted; at other times, entire establishments move.

But migration from New York City is also prompted by factors other than those that organized workers represent. These factors are both political and economic. The postal-zoning law of 1918 is said to have militated against New York City. Although the large markets for books and periodicals have always clustered in the East, the fact that the zone circle about New York includes some five hundred miles of sea is said to put New York City at a disadvantage as a mailing center. Furthermore, the high cost of carting tons of paper from railroad to warehouse, from warehouse to plant, thence, printed and bound, back to the railroad, has made it impossible for New York printers to bid against those who enjoy a railroad siding at their door.[2] Other scarcity values in the form of high rentals for storage and printing facilities have added enormously to the difficulties of the New York printer in bidding against firms operating elsewhere.

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[1] *Prima facie* brief by F. A. Silcox, for the Printers' League Section, New York Employing Printers' Association vs. the New York Press Assistants' Union No. 23, November 1929, p. 29. On p. 137 below is quoted a letter from Mr. Silcox written from Chicago in 1922 which further describes the competition that New York faces, and the policies of Chicago employers with respect to the unions. Chapters VI-VIII will throw considerably more light upon matters discussed in the present chapter.

Thus, as costs have mounted large-edition printing has been leaving New York City. Sometimes it is only the press and the bindery work that have gone, editorial offices and composition remaining where the pulse of the literary market is felt, where editorial and advertising policies vibrate as copy goes to be tapped out on the linotype. Trade-composition houses, which make forms to order for commercial printers but which neither print nor bind, consequently claim a rising relative importance in New York City. Keeping in close touch with the executive and editorial offices that supply them with copy, these houses set up the forms and send them away to be printed.

In spite of all this, the tremendous importance of the time factor—in periodicals that carry current news, for example—has held printing within New York City or has enabled New York printers to retrieve some of the orders once lost to competitors outside. Whatever services the future may bring to minimize the element of time—by airplane, by telegraph, by telephotograph, by television—New York's relative importance as a source of copy and as a convenient distribution point still enables her to hold rather steadily nearly one quarter of the country's book and job printing. This is a fact which the unions frequently point out when they deny that the flood of printing that leaves New York City is in excess of that which flows into New York City.

[2] There is reason to believe, for example, that an annual saving of some $100,000 would be realized by the *New York Times* were it located on one of the tracks of the New York Central Railroad.

2. New York and Chicago as Printing Centers

Next in importance to New York City, Chicago has long been a close second as a printing center, producing as she does some fifteen to seventeen per cent of the country's supply. The fact that no other metropolis in the United States turns out as much as five per cent of the printing throws these two cities, which, combined, produce forty per cent, into high relief in the printing world.

New York and Chicago are distinctive for two other reasons which may be partially interdependent: first, because of the wide difference in the degree to which their pressroom workers are organized, and second, because of the reciprocally changing character of their printing. In 1929, eighty-five per cent of the book and job printing in New York was produced under union-management agreement. In Chicago, on the other hand, only forty per cent was by union agreement.[3] Moreover, the unions in Chicago are less potent than they were twenty years ago, so that the status in general of Chicago pressroom workers in the matter of their wage scales and the complement on the presses is perceptibly lower than that of New York City. In fact, it appears to be safe for the purposes of rough comparison of pressroom performance to think of New York City as a union center in commercial printing, and of Chicago as a non-union center.

The change in the character rather than in the volume of printing in New York City and in Chicago appears so far to be the net result of all of the contending forces which have been described, as they act for or against them as printing centers. As advertising, editorial and other business headquarters in New York City expand, New York tends to produce more and more relatively short-run and short-order printing. Business men send copy to their printer on Monday with a demand for delivery of the finished product on Tuesday. "Purely stock material for which there can be no unexpected demand has already left New

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[3] From *Wage Scales Where Reported*, issued monthly by the United Typothetae of America. It is admitted by the secretaries of the respective employers' associations who submit these data, however, that they are "conversational figures." And it should be added that in Chicago the typographical union, the compositors, have remained relatively strong, so that the over-all estimate of 40 per cent as union-produced printing is high as an estimate of union production in the pressroom.

York in large part. . . . There still remains, however, a surprisingly large amount of standard form printing in New York—bills of lading, telegraph blanks, express forms, etc."[4] Also, many dozens of the smaller periodicals are printed in New York City where they are so largely read. Chicago and the Middle West region, on the other hand, in addition to their own job work, have absorbed the printing of an increasing proportion of the magazines and catalogues for national circulation.

Whether or not, then, the strength of the unions in New York City and their relative impotence in Chicago have been major causes of this migration of printing appears so far in this analysis to be an open question. Looking further, how do we find these cities compare in their adoption of the new printing equipment? Has New York been retarded while Chicago, relatively union-free, has gone ahead?

3. TECHNICAL PROGRESS IN NEW YORK CITY AND IN CHICAGO

First of all, in attempting to answer these questions relating to organized labor's influence upon technical progress, it must be pointed out that the nature of the printing equipment in New York and in Chicago and the size of their respective plants, perhaps regardless of whether labor is organized, necessarily reflect the difference in the character of their printed products. Since 1914, twelve to fifteen has been the average number of persons employed per establishment in New York City, whereas the average for Chicago is nineteen to twenty-five persons. In

TABLE VII

NUMBER OF EMPLOYEES PER ESTABLISHMENT[a]

Year	New York	Chicago	Rest of the United States
1914	12	19	8
1919	11	21	8
1921	14	24	11
1925	15	25	11
1927	13	23	11
1929	13	24	10

[a] U. S. reports of the Census of Manufacturers, statistics on book and job printing.

[4] Hinrichs, A. F., *The Printing Industry in New York and Its Environs, Regional Plan of New York and Its Environs*, pp. 27–28.

CHART IV

Relative Growth of Machine-Fed and Hand-Fed Flat-Bed Cylinder Presses in New York City, Chicago and the Rest of the United States, 1913-1928

The slopes of the lines are comparable at every point and they mean rates of growth from period to period.

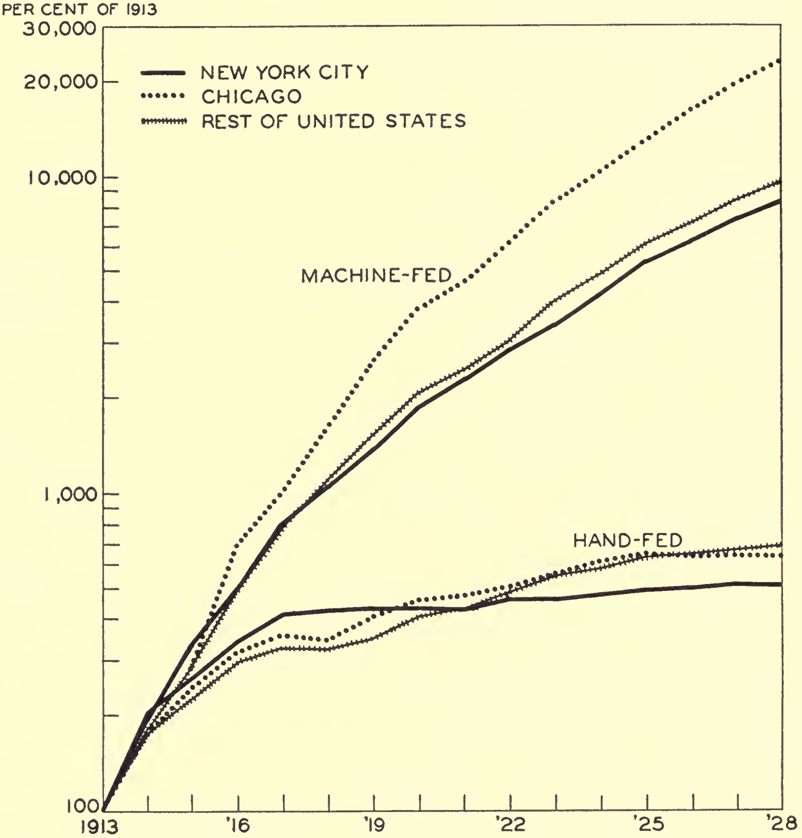
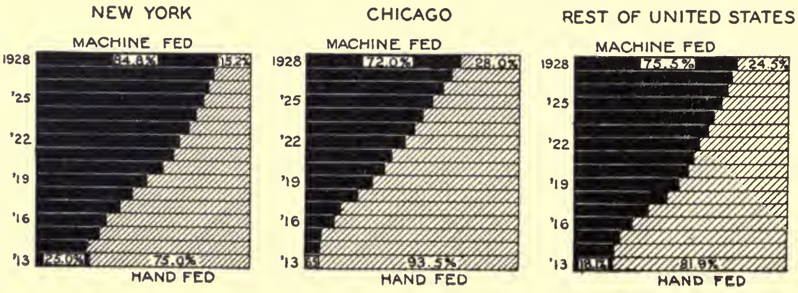


CHART V

Proportions of Cylinder Presses Which Were Machine-Fed and Hand-Fed in New York City, Chicago and the Rest of the United States, Cumulatively by Years, 1913-1928

The actual numbers represented here are shown in Tables 1-3, Appendix A, pp. 201-3.



1929 twenty-two of the largest printers in New York City had a combined annual pay roll of $11,000,000, whereas in Chicago the three largest plants alone had a combined pay roll of $12,000,000.[5]

Automatic Feeding

What, now, are the actual differences in the growth of modern pressroom machinery in New York and in Chicago? The accompanying fan diagram with its supporting "boxes" gives the numerical facts about automatic feeding:

The first glance at this "fan" commands notice because of the meteoric rise of automatic feeding since 1913, and of the plateau which hand-feeding has reached. But more to the present point is that Chicago bolted far ahead of New York in the rate at which she adopted automatic feeding during the sixteen years, increasing 220 times as compared with 80 times for New York.

To be sure caution is necessary here lest the growth lines mislead. The box diagrams (Chart V) show that, despite the rapid increase in automatic feeding on cylinder presses, Chicago's presses at the end of the sixteen-year period were, on the whole, not machine-fed nearly to the extent of those of New York. The higher rate of advance sprang from Chicago's relative backwardness at the starting point when only 9 of her presses were machine-fed as compared with 45 in New York. This made every 100 automatic feeders added to Chicago's 9 register much greater growth than each 100 added to New York's 45.

The somewhat more accelerated rate at which Chicago was installing mechanical feeders as compared with New York during the last years before the present business depression is, of course, not to be overlooked in this search for causal relations. Conversely, the fact must not be unnoticed that even after this long mechanization period, more than a quarter of a century after the introduction of automatic feeders, twenty-eight per cent of the cylinder presses in Chicago, where union power has waned, were still hand-fed as compared with fifteen per cent in New York.

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[5] Told to the writer by the Secretary of the Printers' League Section, New York Employing Printers' Association, Inc.

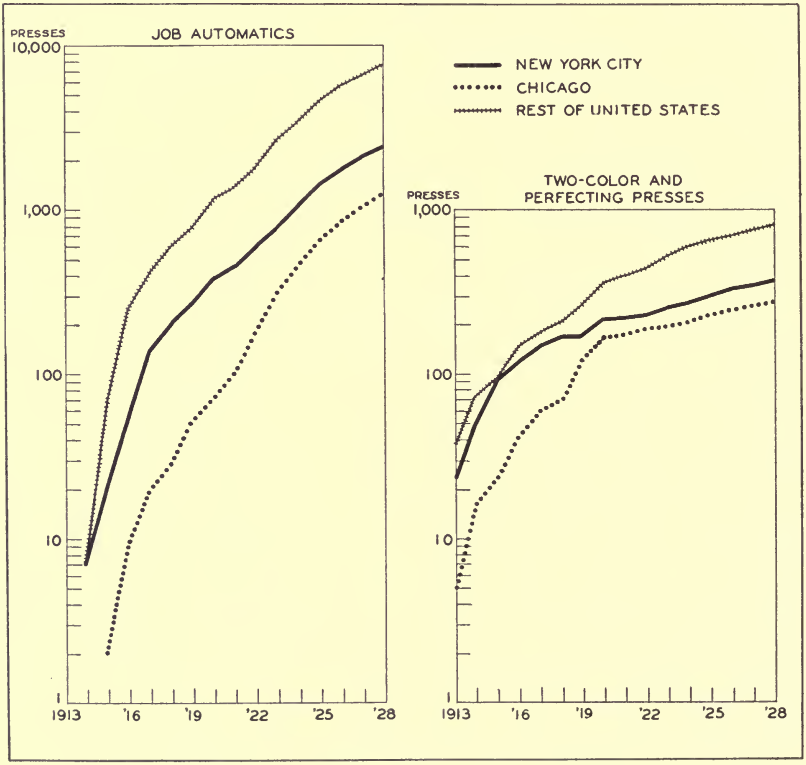
Printing Presses

Automatic feeding tells only half the story of pressroom mechanization. What about the other half? To what extent has Chicago installed the new-model presses as compared with New York—the high-speed job-automatics, for example, and the labor-saving two-color and perfecting presses? Again, diagrams and figures are our best single guide:

CHART VI

Relative Growth of Job-Automatic and Two-Color and Perfecting Flat-Bed Cylinder Presses in New York City, Chicago and the Rest of the United States, 1913-1928

The slopes of the lines are comparable at every point and they mean rates of growth from period to period.



Here, also, is evident the narrowing superiority of New York over Chicago in printing technique. Whereas in 1914, Chicago had no job-automatics, while New York had one-tenth of all those sold in the United States, and whereas in 1917 New York had more than seven times as many as Chicago, by the end of 1928 she had less than twice as many. In 1917 New York had two and one-half color and perfecting presses for every one in Chicago, but by 1929 only one-third more. The lines for these presses indicate about parallel growth in the last two or three years. For the other presses it is clear from the table that lines would show definite although less spectacular gains for Chicago as compared with New York City.

TABLE VIII

PER CENT EXCESS OF NEW-MODEL AND OLD-MODEL CYLINDERS AND OF HAND-FED AND MACHINE-FED CYLINDERS IN NEW YORK CITY OVER CHICAGO FOR 1914, 1917 AND 1928[a]

Press Group	1914	1917	1928
New models			
Job-automatics	[b]	611	95
Small cylinders	27	33	20
2-color and perfecting cylinders	194	153	34
Old models [b]			
Large cylinders	38	32	22
All cylinders	49	65	54
Hand-fed	22	20	−17
Machine-fed	438	291	81

[a] The data from which these percentages were computed appear in Table 5, Appendix A, p. 205. It should also be mentioned that sales' figures for platen presses were unavailable by cities.

[b] All cylinder presses. Chicago had no job automatics; New York had seven.

The changing character of printing in New York and in Chicago appears to be further traceable in a quick comparison of the components of their cylinder-press equipment as seen in the records of sales shown in Table IX:

TABLE IX

Percentage Which Sales in Given Press Groups Were of the Total Sales

Press Group	New York	Chicago	Press Group	New York	Chicago
	January 1, 1929			January 1, 1929	
Job-automatics	53.7	42.3	Old models	23.7	29.9
Small cylinders	14.6	18.6	New models	76.3	70.1
Large cylinders	23.7	29.9	Total	100.0	100.0
				January 1, 1914	
2-color and perfecting cylinders	8.0	9.2	Old models	68.3	73.2
Total	100.0	100.0	New models	31.7	26.8
			Total	100.0	100.0

New York printers have installed more small presses to do their shorter-run job printing and Chicago printers more large presses to do their longer-run magazine and catalogue printing. Job-automatics, even after their rapid adoption in Chicago, formed but forty-two per cent of Chicago's cylinder presses, whereas in New York they were more than half of the total. On the other hand, Chicago uses more large cylinders[6] and color presses than does New York. These expensive machines are uneconomical unless large orders come in to keep them busy.

The necessity of keeping large and expensive machines well occupied if they are to be a profitable investment is, of course, even more true of the rotaries. As Chicago printers have acquired more large-edition printing the proportion of these high-production presses has grown. Complete sales' records of rotary presses could not be secured for this study as has been explained, but the secretaries of the respective union employers' associations estimate that while the number of magazine-web rotaries in New York had dropped from 177 in 1920 to 60 in 1929, at least 300 of such presses are in operation in Chicago.

Thus, in the adoption of new printing equipment the advance in Chicago has been swifter than that in New York. Chicago is still behind the larger center in printing strength but shows marked relative gain. It may be correct to interpret this trend in part as reflecting Chicago's freedom from strong union importunities, but when so doing the facts of congestion and of scarcity values in New York as reflected in rentals and in cost of trucking must not be overlooked, for it may be that they are at least of equal importance.[7]

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[6] 125 of the large cylinders installed in Chicago, 1914–1929, were over 68 inches in bed-size, while in New York there were only nine of these oversize cylinders.

4. Census Outlines

Before turning to consideration of specific pressrooms in a further comparison of New York City and Chicago as printing centers, it is desirable to examine the federal census reports even though they are not given for the pressroom alone, but for all departments combined. The clusters of growth lines with the table of relatives that accompanies them reveal several interesting facts. The first glance at these lines is sufficient to see that book and job printing has materially expanded throughout the country since 1914. Measured in dollars, both New York and Chicago produced some 150 per cent more commercial printing in 1929 than in 1914. This was accompanied by more than 100 per cent increase in pay rolls and a substantial increase in dollar-output per worker, all of which points to greater use of labor-saving machines. Higher relative prices of printing may be partly responsible for the higher value of the product because of rising costs of equipment and overhead.[8]

Wage scales seem not to be a major factor, for wages increased less than output, causing wage-cost per unit of output actually to fall. The descent of the wage-cost line for both cities, as well as for the rest of the country, is in contrast to all of the other rising trend curves.

In brief, the census figures show that New York produces about sixty per cent and Chicago about forty per cent of their combined printing output;[9] that New York employs more work-

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[7] Some firms outside of New York City, for example, whose annual expenditure for ink is high, find they can mix their own ink at a saving of some 40 per cent.

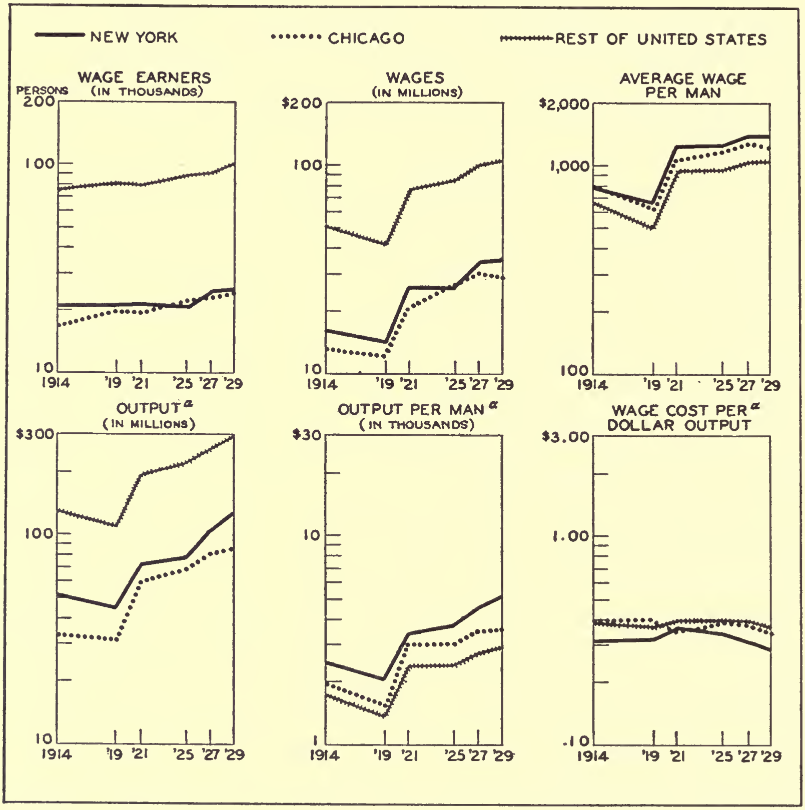
[8] Cost of materials is not included in the value added by manufacture upon which these comparisons are based.

[9] The corrected value added by manufacture in New York City was $51,802,517 in 1914 and $127,658,806 in 1929; for Chicago it was $33,342,934 in 1914 and $85,305,153 in 1929.

CHART VII

GROWTH OF BOOK AND JOB PRINTING IN NEW YORK CITY, CHICAGO AND THE REST OF THE UNITED STATES, 1914-1929

The slopes of the lines are comparable at every point and they mean rates of growth from period to period.



[a] Value added by manufacture.

TABLE X

CHANGES IN BOOK AND JOB PRINTING[a]

Census Item	Per Cent Excess of New York City over Chicago			Per Cent Increase 1914-1929	
	1914	1919	1929	New York	Chicago
Wage earners	24	6	7	21	41
Wages	23	15	22	120	122
Average wage per man . .	−.4	8	15	81	58
Output in dollars[b] . . .	55	41	50	147	156
Output per man in dollars	25	33	40	103	82
Wage-cost per dollar-output[b]	−20.7	−18.7	−18.4	−11	−13

[a] Computed from the respective reports of the United States Census of Manufactures. Figures for 1915, 1917 and 1923 were not reported by cities and those for 1929 were sent to the writer by the Census Bureau in advance of publication. The data from which these percentages were computed appear in Table 15, Appendix A, p. 220.

[b] Value added by manufacture.

ers, pays higher average wages, derives higher per capita value-output at a lower unit wage-cost than does Chicago.

That employment opportunities in commercial printing have significantly increased in Chicago since 1914, while in New York they have relatively declined, is to be seen in the changing number of wage earners. Also, the greater increase in the value of Chicago's production has somewhat reduced New York's superiority in this respect. Nevertheless, New York's pay roll is almost as much greater than that of Chicago as it was in 1914, and the average wages per employee in New York have grown considerably higher than the average wages per employee in Chicago. Workers in New York have grown progressively more productive in terms of dollar sales of printing.

Thus from the employer's point of view in paying for his factors in production the net result of these findings appears to be that, while the workers' share of each dollar's worth of printing in New York had fallen less than in Chicago by 1929, it remained around eighteen per cent less than in Chicago. In New York, workers received twenty-eight cents out of every dollar's worth of printing they produced while in Chicago they received thirty-four cents.[10]

It is necessary to point out that this apparent failure of New York workers to receive as large a proportion of the income from printing as Chicago workers receive does not necessarily mean that their employers make higher profits than do Chicago firms. Aside from wages, which are always well under fifty per cent of total costs, the expense of printing in New York, as has been said, is greater because of high rents for plant space and for storage, not to speak of heavy trucking costs.

To what extent these higher costs in New York are paid by the consumer of printing and in how far they are met by a narrower margin of profits or by a smaller share paid to the workers, is not deducible from the census data. To compile facts of this kind it would be necessary to measure the actual volume and quality of printing which as yet none has been able to achieve because of the absence of standards in both product and process. There is no satisfactory way of discovering to what extent New York's excess of printing production expressed in dollars is due to higher prices for like products and how much it represents superior quality of products. It is probable that both of these factors contribute substantially to the difference in dollar value of production in the two cities. Attempts were unsuccessful to secure from the particular plants included in this study duplicates of their reports to the Bureau of the Census from which somewhat more exact analyses might have been made.

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[10] This is not for the pressroom separately, it should be kept in mind, but for all departments combined. While printing offices differ greatly, perhaps it is safe to say that pressroom workers comprise an average of about 20 per cent of the total workers employed in composing room, pressroom and bindery.

5. Selected Pressrooms in New York and Chicago Are Compared

For sharp comparisons of union and non-union pressrooms we are dependent upon the findings of an intensive survey made in representative New York City plants. It is worth while first to note some differences between a group of three of the largest union and non-union pressrooms in and near Chicago as compared with nine of the largest union pressrooms in New York City. The three outside plants are not only much larger, but are more highly selective from the point of view of apparent relative prosperity than are those in New York. Consequently, it is not surprising to discover much greater mechanization there, as seen in Table XI:

TABLE XI

PRESS EQUIPMENT IN SELECTED PLANTS IN NEW YORK AND CHICAGO, 1924 AND 1929

WINTER OF 1923–1924 AND WINTER OF 1928–1929.

Equipment	New York City (9 large plants—union)			In or near Chicago (3 large plants—union and non-union)		
	1924	1929	Per Cent Change	1924	1929	Per Cent Change
Total Presses	286	317	+10.8	230	291	+26.5
Hand-fed	100	66	−34	39	18	−53.8
Machine-fed	186	251	+34.9	191	273	+42.9
Old models	191	167	−12.5	86	65	−24.4
New models	95	150	+57.9	144	226	+57.0
Large presses	198[a]	211[a]	+ 6.6	191[b]	255[b]	+33.5
Square-inch printing capacity (in millions)						
Total	822	886	+ 7.7	2965[c]	4770[c]	+60.9
Per press	2.9	2.8	− 3.4	12.9	16.4	+27.1
Percentage						
Machine-fed of total . . .	65.0	79.2	. . . .	83.0	93.8	. . . .
New models of total	33.2	47.3	. . . .	62.6	77.7	. . . .
Large presses of total . . .	69.2	66.6	. . . .	83.0	87.6	. . . .

[a] Of which 19 were rotaries in 1924, and 15 in 1929.

[b] Of which 96 were rotaries in 1924, and 160 in 1929.

[c] Partly estimated. Tables 12–14, Appendix A, pp. 216-19, present all of the figures from which this table is drawn.

The tabular picture of the equipment in these two groups of establishments emphasizes the vast difference in their printing capacity. With fewer presses the three Chicago plants had a capacity three times that of the nine New York plants in 1924, and more than five times greater in 1929. This, of course, was due to high-production rotary presses which were more than one-half of all the equipment in Chicago and only five per cent of all the equipment in New York. The proportion of small presses decreased in Chicago and increased in New York, just the reverse of the change in the large presses. Less than half of the equipment was in new models in the New York pressrooms, even in the later period, whereas more than three-quarters of all was in new models in Chicago.

Moreover, press equipment was used more in the Chicago plants than in those of New York. Total chargeable hours were thirty-four per cent more than full daytime hours in 1924 and thirty-nine per cent more in 1929. In New York they were respectively nine per cent and eighteen per cent in excess of full daytime hours for the two periods.[11]

The inference that this excess of machine employment in Chicago meant more employment for the workers than in New York proved valid in a comparison of labor-time purchased by the two groups of firms. In the Chicago plants, eighty per cent of all pressroom labor-weeks[12] purchased in March, 1924 and in March, 1929 were composed of forty-four hours or more than forty-four hours, while the actual number of these forty-four-hour weeks was sixty per cent greater in the later period. In New York City, the proportion of labor-weeks of forty-four hours or more was some seventy per cent of the total in both periods, and 1929 showed an increase of twenty-six per cent in their numbers over 1924.

Although these three plants in and near Chicago are not strictly comparable with the nine in New York because of their disproportionate size, the two groups are fairly representative of the shops between which competition for edition printing is keenest. Job work that is done on the smaller presses is usually turned over to local printers where the demand for it arises, but for the longer-run work it pays to widen the search for the lowest bidder.

And, indeed, it must not be overlooked that, aside from the before-mentioned lower scarcity values outside of New York City that reduce unit cost, employment conditions differ in at least three important ways: (1) Fewer men are required to operate the presses frequently, if not usually, both in union and in non-union shops. (2) While the length of the working week in New York is forty-four hours by day and forty hours at night, elsewhere it is forty-eight hours or more in non-union and sometimes even in union-employing shops. (3) Wage scales are consistently lower outside of New York City.

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[11] The method of measuring machine employment was explained on page 38 above. The full data for New York City and Chicago are shown in Tables 20–22, Appendix A, pp. 225-28. Computations for the two cities are made on a 44-hour week basis in order to compare Chicago plants with the New York union plants. It may be mentioned that these findings appear to be one evidence in refutation of the theory that firms which are not deterred by the challenging demands of a strong union of workers as compared with those who are so deterred, tend to increase their equipment prematurely, ahead of a solidly larger market, and thus become over-machined.

[12] Meaning any number of hours worked by one person during one of the four full weeks in March. This question of part-time employment was discussed more fully for the New York plants in Chapter III, and fuller comparisons between the two cities are made in Table 17, Appendix A, p. 222.

It is not worth while to launch upon the sea of intricate differences in the complement of men on the various presses in the competing establishments in and out of New York City, even if we could, but a few notes on comparative wages will be suggestive. From the brief of the New York employing printers against the press assistants' union in 1929, the arbitrator was informed that "in 52 cities competitive with New York City the union scale for cylinder feeders ranges from $2.25 to $29.50 below the New York scale," and that "22 competitive cities operate largely non-union on a 48-hour week basis and compared with New York City's 44-hour week the cylinder feeders' hour rates in these non-union cities range from 19 per cent to 59 per cent below the hour rates for New York City."[13] In Chicago, in 1924, for which year the first equipment census was taken for this study, non-union shops were paying their cylinder pressmen $48.00 and the assistants $40.00 for a forty-eight hour week. In the New York union shops the scale for cylinder pressmen was $53.00 and for assistants $42.50 for a forty-four hour week. In 1929 the Chicago scales had remained the same while the New York union rates were $56.00 and $45.50 for cylinder pressmen and assistants respectively.[14]

Union rates in Chicago in 1924 were $49.50 for cylinder pressmen and $41.50 for cylinder assistants. They became $51.00 and $43.25 in 1925 where they have remained ever since, except for depression adjustments which have been made in both New York City and Chicago. Open shops have gained so strong a lead in Chicago that the pressroom unions have not only been unable to improve their status but have found it practically impossible to maintain it. In fact, an official of the international union in 1927 after investigating Chicago conditions is reliably reported to have admitted that "the international union has more members working in non-union shops in Chicago than it has in union shops."

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[13] *Op. cit.*, pp. 15–18.

[14] From *Wage Scales Where Reported, op. cit.*

Moreover, from December, 1928 until the summer of 1932 there were "no contracts [with local unions] in existence governing the operation of union pressrooms in book and job shops in Chicago."[15] Union employers negotiated directly with the international union. During these years the international union enrolled large numbers of men as members-at-large in non-union plants, hoping that the time would come when they could organize the shops which employed them. This was accomplished only to a limited extent, however, and even then agreements with employers were made secretly and with liberal concession. A number of these agreements made by the international union expired in July, 1932.

6. Union and Non-Union
Pressrooms in New York City

Coming now to the plant survey which was made in New York City, this necessarily fragmentary discussion of union and non-union pressrooms can be brought to a sharper point. Of the fifty-three plants included in the survey, it will be recalled that eight were among the largest of the open shops that operate in New York City and thirty-six were medium-size union shops. While, as was the case between the larger New York and Chicago plants just compared, the two groups of New York offices differed in their average sizes, in this case the open shops being the smaller, they were representative competitors for job printing, and from this standpoint are comparable.

Interestingly enough, the pressroom equipment of these two groups of smaller printing offices differed in the same ways as did the large New York and Chicago plants. As shown in Table XII, the growth of the open shops exceeded that of the closed shops—in the adoption of mechanical feeding and of new-model presses and in total printing capacity.

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[15] Pamphlet, *Our Mutual Problem*, published by the Franklin Association of Chicago, June, 1929, Harry G. Cantrell, secretary. In May, 1932, the old contracts of 1925–1927 between the Franklin Association and the pressroom unions became effective for a period of one year, and were used as a basis for making adjustments to the depression in the form of a seven-per-cent reduction in wage rates and a spreading of work.

Among the small presses which greatly predominate in these pressrooms, job-automatics formed sixteen per cent of the total presses in the union shops in 1924 and thirty-eight per cent in 1929. In the open shops the proportion was twenty-six per cent in the earlier period and thirty-nine per cent in 1929.

TABLE XII

PRESS EQUIPMENT IN UNION AND IN NON-UNION PLANTS IN NEW YORK CITY, 1924-1929[a]

WINTER OF 1923–1924 AND WINTER OF 1928–1929.

Equipment Item	36 Union			8 Non-Union		
	1924	1929	Per Cent Change	1924	1929	Per Cent Change
Total presses	358	419	+17.0	50	66	+32.0
Hand-fed	209	183	−13.9	24	22	− 8.3
Machine-fed	149	236	+60.4	26	44	+69.2
Old models	253	230	− 9.1	33	30	− 9.1
New models	105	189	+80.0	17	36	+111.8
Small presses	246	301	+22.3	43	56	+30.2
Square-inch printing capacity (in millions)						
Total	338	436	+29	34	51	+50.0
Per press	.94	1.04	+10.9	.68	.77	+13.2
Percentage						
Machine-fed of total	41.6	56.3	....	52	66.7	....
New models of total	29.3	45.1	....	4	54.5	....
Small presses of total	68.7	71.8	....	86	84.8	....

[a] Tables 12–14, Appendix A, pp. 216-19, present the figures from which this table is drawn.

These findings bear comparison with the estimate made by the New York employing printers in 1924—that, of all job-automatics so far sold in New York and Brooklyn, eighty-seven per cent were in open shops and only thirteen per cent in union shops. The point to be made, which the employers would of course concede, is that, because of the difference in the *nature* of the respective groups of enterprises, open-shop equipment cannot be compared with that of union shops in this wholesale manner to throw light upon the influence of organized labor against the adoption of new machinery.[16] Only about 250 out of the 2,000 or more printing offices in New York are unionized, and these are all of fair size, using large as well as small presses. On the other hand, most of the non-union shops are small, many being of the one-, two- or three-man order whose one or two job automatics are their all.[17] Our findings as just given seem to show that when union and non-union offices of comparable size are compared, the difference in their relative adoption of the new presses may be significant, but it is not spectacular.

As for the feeding process, more than four-fifths of the hand-feeding in both groups of plants and in both periods was done on the older presses—platens and large cylinders—with the number of hand-fed platens actually increasing. In the union shops, large cylinders were more hand-fed than platens, seeming to denote considerable idleness for the larger presses which are usually intended for longer-run work for which it pays to invest in a mechanical feeder. In the open shops, on the other hand, large cylinders were more machine-fed than platens, and their number increased, seeming to denote more long-run orders. Although some thirty per cent of the total equipment in the union shops was in large presses, more than one-half of it remained hand-fed; whereas only fifteen per cent of the equipment in the open shops was in large presses, and exactly half of it remained hand-fed.

The grounds for drawing inference here are limited, but it is possible that these facts reflect increasingly successful competition of open with closed shops in New York City for larger-size and longer-run job work on a lower-price basis. According to the proprietors, the insistence of the unions upon keeping too many men on the presses at a high wage tends to discourage investment in improved machinery because any profits that may emerge in spite of the unions have to be given away to customers in lower prices. The open shops on the other hand are more free to weigh wages against interest and depreciation and to make the choice which they deem more favorable to bidding for business.

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[16] Nevertheless the printers' league has again used these kinds of data in presenting more recent findings in its investigation of equipment in the pressrooms of New York City as may be seen in the résumé of the pressroom survey of the Printers' League Section, Appendix B, Exhibit 19, pp. 250-52.

[17] According to the secretary of the New York printers' league, the median size of union shops in New York City is in the $25,000 to $50,000 pay-roll group, while that of open shops is in the $5,000 to $10,000 pay-roll group.

It is unfortunate that no measured comparison can be made of the quality of workmanship in these pressrooms. The contention of the unions always is that the non-union shops attract the orders for inferior printing that can be produced at a cheaper rate. On the basis of the data of the writer it is impossible to refute or support this assertion.

The weekly-wage scales of the New York City non-union shop workers were distinctly below those of the union men in both periods of the five-year plant survey, and the differential was greater in 1929. The subjoined table shows the rates on the cylinder presses:

TABLE XIII

WAGE SCALES IN NEW YORK CITY UNION AND NON-UNION SHOPS, 1924 AND 1929

Cylinder Pressmen			Cylinder Press Assistants	
Date	Union[a]	Non-Union[b]	Union[a]	Non-Union[b]
1924	$53.00	$50.00	$42.50	$37.00
1929	$56.00	$50.00	$45.50	$37.20

[a]Forty-four-hour week.
[b]Forty-eight-hour week.

It may be mentioned at this point that in addition to the lower wage scales paid in non-union shops, it is not unusual for press assistants to do pressmen's work at a scale lower than that for pressmen. In fact this is one route by which press assistants become union pressmen. If a man is ambitious and mechanically minded he can sometimes prepare himself in an open shop to be a full-fledged pressman more quickly than by being a member of the assistants' union. His ability to pass the qualifying examination at the pressmen's school is the test of his success.

The Complement of Men

What now of the complement of men in union and in non-union shops? That there is a difference has been intimated more than once in the previous pages, and the long struggle, about to be related, of union employing printers to reduce the number of men continues unabated. Table XIV brings striking testimony of the comparative customs in respect to the complement of men.

TABLE XIV

NUMBER OF MEN EMPLOYED PER 100 PRESSES IN UNION AND IN NON-UNION SHOPS, 1924 AND 1929[a]

PRESS GROUP	36 UNION SHOPS								
	Total Men			Pressmen			Assistants		
	1924	1929	Per Cent Change	1924	1929	Per Cent Change	1924	1929	Per Cent Change
All presses . .	99.2	100.7	+1.5	40.2	44.9	+11.7	59.0	55.8	−5.4
Old models . .	104.0	112.2	7.9	38.7	41.3	+ 6.7	65.2	70.9	+ 8.7
New models .	87.6	86.8	− .9	43.8	49.2	+12.3	43.8	37.6	−14.1
	8 NON-UNION SHOPS								
All presses . .	86.0	87.9	+ 2.2	36.0	40.9	+13.6	50.0	47.0	− 6.0
Old models . .	84.8	106.7	+25.8	33.3	40.0	+20.1	51.5	66.7	+29.5
New models .	88.2	72.2	−18.1	41.2	41.7	+ 1.5	47.1	30.6	−35.0

[a] These percentages are drawn from Appendix A, Table 8, p. 209, showing the complete calculations for all of the 53 printeries.

It is noteworthy that union and non-union offices registered in the same direction their changes in the ratio of men to presses over the five-year period. As was true for the entire group of fifty-three plants in New York City, the increase in men for all presses was clearly due to the older models,[18] for on the new models the ratio of men to machines dropped.

Because of the shortness of the period over which these comparisons are made, however, the actual differences in the number of men employed to each 100 presses in the union and non-union offices is probably more noteworthy than the changes that took place. Here, in addition to the differentials in wages and in hours lies the essence of the grievance of union employers against their men. In 1929, open shops were employing only 88 workers per 100 presses while union shops employed 101 workers. The ratio on the new models was 72 in the non-union and 87 in the union offices.

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[18] There were more hand-fed platens in 1929, and also, in the non-union shops, more large cylinders, which accounts for the greater ratio of men on the older machines.

Of course it is possible that in these non-union pressrooms there were fewer men because there was more idle equipment than in the union shops. Unfortunately, no reliable figures could be collected to clarify this point but general observation as pressrooms were visited made it seem unlikely. Moreover, it will be remembered that the press equipment of the large pressrooms in and near Chicago was used substantially more than that in the large union plants in New York.

Whether non-union plants had indulged in serious displacement of men in making their early adjustments to the new techniques, this investigation did not disclose. The complement of men has long, if not always, been smaller in open than in closed shops, and it is possible that whatever reduction the new techniques brought about was obtained largely through the processes of attrition rather than by direct dismissal. Analysis of changes during the five-year period as seen in the tabular views of pressrooms, it will be recalled, appeared to reveal somewhat less discharging of men in the non-union than in the union shops, although the total displacement of jobs and processes was greater.

Pressmen Displace Their Assistants

The heavier incidence of mechanization upon press assistants as compared with pressmen, which has been everywhere in evidence in the foregoing pages, is also found to be emphasized in the non-union shops as seen in Table XV.

TABLE XV

NET CHANGES IN EMPLOYMENT OF PRESSMEN AND ASSISTANTS IN UNION AND IN NON-UNION SHOPS, 1924-1929[a]

Press Group	Thirty-Six Union			Eight Non-Union		
	1924	1929	Per Cent Change	1924	1929	Per Cent Change
All presses:						
Percentage pressmen of total men . .	40.6	44.5	+ 9.6	41.9	46.6	+11.2
Percentage assistants of total men . .	59.4	55.5	− 6.6	58.1	53.4	− 8.1
Old models:						
Percentage pressmen of total men . .	37.3	36.8	− 1.3	39.3	37.5	− 4.6
Percentage assistants of total men . .	62.7	63.2	+ 0.8	60.7	63.5	+ 3.0
New models:						
Percentage pressmen of total men . .	50.0	56.7	+13.4	46.7	57.7	+23.6
Percentage assistants of total men . .	50.0	43.3	−13.4	53.3	42.3	−20.6
Percentage hand-feeders of total assistants	71.5	55.1	−23.0	60.0	54.8	− 8.7

[a] Table 7, Appendix A, p. 208, presents the more complete data.

The net loss of employment for assistants in the non-union pressrooms was 8.1 per cent as compared with 6.6 per cent in the union pressrooms, the gains for the pressmen being 11.2 per cent and 9.6 per cent respectively. The vestigial character of the assistants' occupation seems to be registered in both groups of offices by their increase over pressmen on the older models and their marked decline on the new. In the union pressrooms the hand-feeders took much the greatest drop of all.

7. SUMMARY

In summing up these objective considerations of the influence of organized labor upon technological change, it is clear that the data are too incomplete to serve as a basis for establishing causal relationships. Inferences must be drawn with caution. The findings seem to be about as follows:

(1) Although federal census reports are not made for the pressroom alone, with which we are specifically concerned, they do show for the book and job industry as a whole that New York, where pressrooms are strongly organized, employs more workers, pays higher average wages and derives higher value-

output per man at a lower unit wage-cost than does Chicago where pressroom unions are much less strong.

Nevertheless, in 1929, New York workers received only twenty-eight cents out of every dollar's worth of printing that they produced, while in Chicago they received thirty-four cents.

There is no satisfactory unit by which the volume and quality of printing can be measured. However, the greater value of the product in New York is doubtless due partly to higher prices for printing, possibly also to a superior average product, as well as to general scarcity values that prevail in New York.

Available data give no basis for concluding whether profits in union shops are higher or lower than are profits in non-union shops.

(2) The predominant character of commercial printing in New York City is changing. This may be due as much to the postal zoning system and to scarcity values in the form of high rentals and trucking charges as to the "tyranny of the unions." Although New York has lost much of her long-run printing while Chicago has gained, her importance as a source of copy and as a distributing center, together with the vast amount of job work she consumes in connection with her commerce and manufacture, so far enable her to hold about one-fourth of all of the nation's commercial printing. Chicago produces about one-seventh of the total supply.

(3) During the sixteen years preceding the present business depression, Chicago's adoption of labor-saving machinery for the pressroom was swifter than that of New York and this progress has narrowed the superiority of New York over Chicago in printing strength. Moreover, the pressroom unions in Chicago declined in strength during this period, while those in New York became more potent than ever. These trends appear to be worth noticing for future consideration of the interactive forces between trade unionism and adoption of new techniques.

(4) Wage scales are lower and working hours longer in non-union pressrooms where no collective agreements between employers and men exist than they are in the union pressrooms of New York City controlled by collective agreements.

(5) Comparisons of pressroom equipment show that in non-

union shops the newer labor-saving models form a larger proportion of the whole than they form in the union shops; also that a smaller ratio of men to presses obtains in the non-union shops.

(6) The preference for pressmen and the weakening position of press assistants or feeders is evident in all pressrooms as the occupation of hand-feeding the presses becomes obsolescent. These gains for pressmen and losses for press assistants are greater in the non-union shops.

(7) Finally, in so far as these combined but incomplete facts may be trusted to reflect the actual situation, it appears that while organized labor may have retarded advance in pressroom technology, it is less directly influential than some have thought it to be. For we find much technical progress both where the unions are strong and where they are weak, and the greatest advance has occurred where the unions are strongest.

CHAPTER VI

COLLECTIVE BARGAINING AND THE NEW MACHINES UP TO THE WORLD WAR

We have seen that two currents of displacement have been flowing through the book and job pressroom as a result of mechanization. First, the new machines require fewer men to operate them although expansion of the industry has created employment for an increasingly larger number of workers. Second, as the important but monotonous task of hand-feeding the presses becomes a thing of the past, the manual feeders are no longer indispensable, and they seem unable to hold their own in the rôle of general assistants to the pressmen and operators of the automatic feeders. On the contrary, as their duties become diffused, their employment opportunities tend to shrink while employers declare their preference for pressmen.

The statistical study of technological changes, aided by our visits to pressrooms for observation of shop practice has brought us this far in our inquiry. But further questions remain to be answered, particularly as the changes discovered have been made so largely through collective bargains with the unions: (1) To what extent have the unions objected to new equipment that takes over more and more of their work? (2) What is the status of these unions as a result of the cumulative forces of mechanization? (3) What is the outlook for the press assistants? Can they become pressmen as the demand for pressmen grows? (4) What has been the relation of pressmen and press assistants in their bargaining with employers as the incidence of technological change has come to fall so unevenly upon them?

1. THE SETTING

Commercial printing employees have been strongly organized throughout the modern era of printing—from the early days of unformed crafts down to the present time—and the collective bargains with employers present a story of conflicts, poignant, and in their own way dramatic. Among all the strands of action that twist in and out of the story, the struggles of press-feeders are especially vital, as far as this study is concerned, because of the abolition of their occupation. The rise of the press-feeders from what seems to have been scarcely more than a threshold occupation to a strongly-organized craft was attended by problems of apprenticeship and contests over the relative importance of the feeder-assistant. The feeders' efforts concerning the shorter working day, the complement of men, wage scales, and working conditions, have been strongly interwoven from the beginning until now with those of the more skilled craftsmen. And throughout, the progressive introduction of labor-saving machines has been a major provocation.

Modern book and job printing began in the early 1880's; and for two decades thereafter important events that are pertinent to the present inquiry clustered so closely together that an interaction of cause and effect appears certain. These events were both technological and strategic, mechanical inventions being closely accompanied by the organization of men—of workers on the one hand and employing printers on the other. The linotype was introduced in the composing room in 1886. In the pressroom, although single-cylinder presses had been on the horizon for years, apparently the first to have been recorded was in 1882. The year 1890 brought the first modern magazine-rotary presses and 1899 the first automatic press-feeding attachments. As we have seen, new models have entered the stage since then with increasing and cumulative effect.

The greater specialization of printing departments which developed with the modern machinery brought with it a specialization of craft unions. The International Typographical Union, one of the country's earliest and strongest labor unions, had taken permanent form in 1852 (though it did not take this name until 1869) and had included both compositors and pressroom workers. But by 1889, the pressmen had broken away from the compositors and formed their own international organization. Seven years later, 1896, the International Printing Pressmen expanded to include the press-feeders and became the International Printing Pressmen and Assistants' Union. This merger was promoted not because pressmen and their assistants worked happily together, for the contrary was the case, but because pressmen saw the advantage to themselves of closer political contact with their assistants. Master printers, too, who had been organized in several of the important printing centers formed the United Typothetae of America in 1887.

So the simultaneous mobilization of human and mechanical forces appears not to have been accidental. The International Typographical Union urged that operation of the new linotype was more exhausting than setting type by hand and that the increased efficiency of compositors equipped with linotypes warranted a shorter working day.

The year 1887 brought insistence upon a nine-hour day which was achieved in 1899, with eight hours for machine compositors following soon after. Newspaper publishers were relatively acquiescent to these demands from their compositors, for to them the number of hours worked is always of less concern than that enough skilled workers are on hand in the composing room during the last hours before the forms go to press. But to book and job printers a reduction of working hours is a different matter, and the United Typothetae of America undertook to oppose it. Quite different from the newspaper business, commercial printing is a made-to-order product with none of the expenses met by advertisers. Consequently, a shorter day in book and job work pointed to higher unit costs, with no hope of compensatory increase in prices because of the highly competitive nature of the industry. Moreover, competition was being sharpened by the use of improved printing presses.

Thus the national organization of employing printers was born out of intense labor troubles with which it was doomed to wrestle for many years to come, the chief provocations being the shorter working day, the manning of new machines and the wages to be paid. Throughout the struggles, the strong newspaper contingents in the unions have been in the van, dragging their book and job colleagues along in the wake of their victories, and leaving the path strewn with groups of workers who couldn't keep up, and with increasing numbers of resentful nonunion employers. Local Typothetae, perhaps especially those of New York City, St. Louis and Chicago, had organized to center attention, not upon labor, but upon the problems of price cutting that harassed them. It is ironical that their first united effort was consumed in a contest with organized labor from which they developed active hostility to the unions. Later exigencies brought them to substitute an open-shop policy for anti-unionism, and thence, in 1920, they returned to their original position of remaining entirely aloof from labor problems.

Pressroom workers in book and job printing have been closest in line with the newspaper unions in their dealings with employing printers. The bindery and mailers' unions have followed as they could. The demands of the pressmen, during the years of struggle over installation of new machinery, have been least of all resented by their employers. Probably this is explained by the greater trouble that came from the unions occupationally nearest them—the progressive and powerful typographical union on the one side, and the press-feeders on the other—young, undisciplined and ruthless.

In this setting the pressmen, whether or not their demands were granted by their employers, have always been held in special favor as highly intelligent key-men. The compositors have commanded attention and received it, while the press assistants have fallen into less repute. In New York, the bargaining power of the pressmen stimulated by the compositors has strengthened the press assistants. This, together with political leverage which assistants have enjoyed, has, until recently at least, enabled the pressroom unions to show effective power through many a hard struggle.

Developments in Chicago have followed a very different course. Down through the years employing printers have been increasingly converted to the open-shop cause. The tactics of press assistants have been intolerable to the employers. They are "the cause of 90 per cent, yes 100 per cent, of our troubles," some say with heat; "the only deliverance is through the adoption of automatic feeders." Chicago pressmen have not been able to hold the assistants in subordination as the employers expected them to do. In fact, Chicago pressmen, although respected, have never seemed to outgrow scars left by jurisdictional disputes with press-feeders before 1907. It was then that the feeders, like wayward children, kept their local union free from control by the organized pressmen.

During the years of the World War, irritation of Chicago employers by the press-feeders was renewed. In some cases by direct action the feeders extracted bonuses from the War Labor Board that hoisted their wage scales to levels out of proportion to those of pressmen and compositors. These victories in turn, it is attested, dampened the incentive of feeders to become pressmen, the wage differential being so small that they frequently chose to avoid the responsibility that pressmen's work involves. The climax was reached when, in 1921, the union movement for a shorter working day culminated in the achievement of a forty-four hour week. The New York pressroom unions suffered only temporary setbacks at this time, effectively supported as they were by the typographical union. But, as was suggested in the preceding chapter, the pressroom unions of Chicago have scarcely risen from the low point of 1921 because of persistent employer opposition. They fell with the compositors but they were unable to rise with them. Whereas the wage scales of Chicago compositors, who controlled 75 or 80 per cent of composing-room production, increased more than $10.00 a week after 1921 and a working week of forty hours was won, the wage scale for pressmen and assistants, now only forty per cent unionized, rose only a little over $3.00 a week, and has not moved at all since 1925, except for recent depression adjustments downward.

2. The Rise of the Press-Feeders

The first presses of the eighties were slow in operation and required little skill in feeding the paper. Pressmen took on inexperienced boys to do this work. But during the nineties rapid improvements were made in printing technique. The little platens were speeded up and the cylinder presses were made larger, faster and more accurate. A certain skill became necessary to feed the improved presses. The boys had to be better trained, and in turn, the larger investment which the machines represented made it prudent to employ better feeders. These workers, too, could do more than feed—they learned to assist the pressmen in making ready the form. Under the pressmen's direction they "patched up" to bring the type into even contact with the paper in the printing process. Consequently, the very closeness of the feeder-assistants to the pressmen and their work, if they were at all alert and mechanically minded, furnished an important part of their instruction as apprentice pressmen. Press-feeding and assistance to the pressman became a natural threshold to the pressman's craft.

These newly-recruited feeders were left so much to their own development, that, feeling their importance, they formed independent unions in New York and in Chicago. The consequence was that, whereas the boys had received $4.00 to $6.00 a week, New York and Chicago firms in the 1890's paid them from $8.00 to $12.00, and bonuses for particularly good work became a custom. In fifteen of the larger New York City offices, $14.00 a week was being paid to one or more expert feeders in each establishment, "the theory being that a feeder who could increase the product of a large press three or four tokens a day is easily worth an added two dollars per week."[1]

According to H. A. Adam who wrote at that time, this $14.00 a week which selected feeders were receiving in New York City proved too tempting for their associates in that city and in Chicago and, without giving notice, feeders struck in New York. In one large office the strike was taken to arbitration, the $14.00 rate being demanded and paid under protest during the proceedings. If report is correct that the union committee prolonged the dispute because delay in settlement was to their advantage, this is probably the first display of this form of tactics for which the feeders' unions later became noted, and which led to their unpopularity.

Making use of the New York leverage, Chicago feeders in April, 1898, inaugurated a strike for increased wages in the larger publication offices. Their top rates had been from $7.00 a week on the platens to $10.50 on the larger cylinder presses. They demanded a $1.00 increase all along the line, raised to $1.50 on the larger presses. Unlike the development in New York, however, a compromise was soon effected which declared increases up to $1.00 for Chicago press-feeders, the highest wage being $11.50.

[1] Adam, H. A., "The Feeder Problem," *The Printer and Bookmaker*, August, 1898, p. 279.

Thus before the advent of the automatic feeder, manual feeders, now known as press assistants, entrenched themselves in the pressroom as masters of a craft. Their gains stirred resentment among employers and jealousy and anxiety among pressmen. New York City printers were obliged to pay them more than they received in Chicago, and these two cities were threatened by the lower-wage small centers. In a few instances in New York, feeders received as much as $16.00 "because they are virtually pressmen, and do general making ready."[2] The year before the introduction of the first automatic feeding machines an employer wrote:

> We are confronted with the question whether the manual feeder, the fellow who shoves in the sheets with untiring accuracy, and who assists the pressman in patching up, and who never forgets to raise his rollers at noontime or night—will he be superseded by a machine that simply draws the sheets from a pile and feeds them to the guides of the press? Just now the human feeder is assisting the making of an affirmative answer to this question by stirring up things in leading cities, and demanding increased wages. He has taken lessons in unionism, and has proved such an apt scholar that he has taken to dictating to the bosses, to the pressmen's union, and even to that august body, the International Typographical Union.[3]

And, after noting that patents for paper feeding had been secured by as many as sixteen individuals and firms, this writer continued to expound the feeder problem:

> Now the problem is, will the proprietors of printing offices put up with the general encroachments of the feeders' unions, and grant them wages that approach those of skilled workmen, or will they take to the machines, and retain only boys at low wages for the smaller and lighter presses? It does not require much of a prophet to answer. The feeders' unions are hastening their own downfall by crowding employers at a time when they should be least exacting. In view of a competition that they cannot meet. If feeders had continued to regard themselves as apprentices to be pressmen, or as unskilled laborers, there would have remained some chance of their being preferred to the feeding machines, because they can do many things that the machines can never hope to accomplish, such as putting up the paper to the feedboards, handling the rollers, patching up, etc. But with manual feeders

[2] *Ibid.* [3] *Ibid.*

demanding $12 and $14 the success of the machine feeders is seemingly assured, for proprietors will gladly try them, and put up with any shortcomings until they are made to operate as smoothly as other machines that have been in long use.[4]

This prophecy, made before machines had fed a single sheet of paper into a press, might, in spirit, have been written today, thirty years after the introduction of the automatic feeder. Here seems to have been the vision of hindsight pointing to the feeder's position logically as one either of apprenticeship or of an unskilled laborer—not as a craftsman in his own right as he was allowed to become. On the other hand, the writer was over-optimistic about the deliverance of employers from manual feeders through automatic machines. Printing presses were notoriously unstandardized—as they still are—and no automatic feeders for platens appeared until 1910. For reasons both technical and human only 4 per cent of the 61,000 platen and cylinder presses were machine-fed up to as late as 1913.

In the meantime the manual feeders, unselected and undirected, became 1,500 strong in Chicago, and independently formed their Franklin Union, No. 4. They incited jurisdictional disputes with their pressmen by urging platen pressmen to join them, they gained the sympathy of the typographical union, and they were the first union to sign an agreement with employers of the Chicago Typothetae who were deeply disturbed by their power. In New York, as has been said, the feeders were somewhat controlled by the older unions with whom they had been associated since the 1890's. There, under the International Printing Pressmen and Assistants' Union, they formed two locals according to the kind of presses they fed—Franklin Associated Press Feeders, No. 23 was composed of the senior or cylinder-press group while the juniors on the platens became Job Press Feeders No. 1.[5]

3. The Rise of the Apprentice Problem

The anxiety that press assistants have always caused their pressmen is, therefore, a legacy from the industry itself. It appears to have persisted chiefly because the early apprentice problem was not tackled and solved. Long before pressmen were recognized as masters of a separate craft, printers and their apprentices developed a competitive spirit. Half-taught apprentices who had run away or had been dismissed by their seniors were frequently employed at two-thirds of the regular journeyman's wage, and "proved a great pest to the profession." They were called "two-thirders" or "half-way journeymen." As far back as the period after the war of 1812, the New York Typographical Society found itself obliged to strike not only for an increased wage but also against this practice of employing "two-thirders," and for an arrangement for the instruction of apprentices. Allowance for training was granted by the masters but a plan for meeting the apprentice problem progressed no farther than discussion and a few vague promises of reform.[6]

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[4] *Ibid.* [5] Stevens, G. A., *New York Typographical Union, No. 6*, pp. 556-58.

Throughout the nineteenth century the printers' apprentice problem grew, with groups of workers attempting regulation each in its own way. Many more learners became journeymen printers than the industry required. It was largely as a result of overcrowding that a class of journeymen, many of them highly skilled, took to the road, becoming "tramp" printers, with whom regularly-employed printers were frequently expected to share their work.[7]

The coming of the linotype largely solved the problem of the oversupply of learners among the compositors. "Since straight composition was the branch of the work to which the machine was best suited, the profit from apprentices sensibly decreased, and the future needs of the business became the controlling factor in the regulation of the number of apprentices."[8]

But this was not the case in the pressroom. Automatic feeding machines came later and more gradually than the linotypes. And, unlike the straight-line apprenticeship of boys on the linotypes, printing presses demanded their manual feeders whether or not there was any room for them ever to become pressmen. Many more feeders were required than pressmen so that the feed-

[6] Morgan, C. E., *The Origin and History of the New York Employing Printers' Association*, pp. 35–36; Barnett, G. E., *The Printers*, p. 163.

[7] Barnett, George E., *Machinery and Labor*, p. 23.

[8] *Ibid.*, pp. 23–24.

ing job, logically a threshold occupation, more often became a *cul de sac* instead.

This inherent complication in pressroom apprenticeship that denied simple progressive outlet for the feeders, seems to have failed almost completely to challenge active thinking for its solution. Curiously enough, aside from such observations as those quoted above from Mr. Adam, the only active plan came from the feeders themselves. And this was rejected both by pressmen and by master printers.

The episode is notable in Chicago pressroom history. The feeders' union, Franklin Union No. 4, having become powerful about 1900 and, remaining outside the International Printing Pressmen and Assistants' Union until 1907, was exceedingly troublesome both to pressmen and to employers. Disputes centered chiefly about apprenticeship practice. The union rule, accepted in 1901 by feeders and pressmen alike, had read that a member of No. 4 who had worked at a cylinder press for two years and received $15.00 per week might be recognized as an apprentice pressman and be transferred to Pressmen's Union No. 3. If, then, after five years apprenticeship he could earn the journeyman's scale of $22.50, he became a full-fledged pressman.[9]

The press-feeders' union became dissatisfied with this practice. They said it restricted promotion, that a feeder who became an apprentice and as such was transferred to the pressmen's union had not sufficiently shown that he was competent to become a journeyman pressman, yet he would never return to the ranks of the feeders. On the contrary, he would stagnate as an apprentice pressman and block the all-too-narrrow way for others behind him. The feeders proposed, therefore, that those who became apprentice pressmen remain in No. 4 for three years instead of two, and that they be in the $18.50 class before being transferred instead of in the $15.00 class. This they held would tend to eliminate the promotion of incompetents and provide advance for promising men.

The feeders' contention led to a dispute which was decided by arbitration against them. The decision, as is too generally the case in arbitration procedure, merely followed the custom of the trade—feeders continuing to be declared eligible for transfer when they received a weekly wage of $15.00.

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[9] Brown, Emily Clarke, *Book and Job Printing in Chicago*, pp. 82–84. This is an excellent analytical presentation of the industry and its labor problems and has been freely drawn upon in these pages.

Chaos followed this decision, and contracts were broken. Finally, the widespread employment of girl feeders and the coalition of pressmen with employers to form a rival press-feeders' union were the forces that brought Franklin Union No. 4 into the international fold, in 1907.[10]

In this way, what looks to us now like action which might have led to an orderly segregation of potential pressmen from those capable only of feeding the presses was promptly thwarted. The problem thence took deeper root. Press-feeders continued to be an indiscriminate and poorly directed army of low-skilled men, who in self protection developed survival weapons as craftsmen in their own right. Only today is there hope of developing a plan for the selection and training of apprentice pressmen. But at this late date such a plan almost inevitably assumes the aspect of offensive warfare on the part of the organized employers, stirring resentment, hurt pride, and loss of remunerative positions among the press assistants.

The rôle of the pressmen in this struggle is relatively passive, breaking into activity at times on behalf of their fellow workers in the International Printing Pressmen and Assistants' Union, and, at other times, into sub-surface pressure to crowd them down. Unfortunately, strong leadership from the international union is diluted not only by this veiled conflict between the two groups that compose it, but also by concession for personal political advantage.

4. Early Stages of Interaction between Men and Machines

Automatic press-feeding machines, heralded as bringing deliverance from troublesome manual feeders by replacing them, appeared at the turn of the century. The so-called "pile" feeder came first, in 1899, followed by the "continuous" feeder four years later. These mechanisms were described and their photographs are shown in these pages. The pile-machine, standing on the floor, fed the sheets by mechanical push-fingers[11] from a pile of paper placed on the feed-board close by the head of the press. The continuous feeder stood six steps above the head of the press to which the assistant carried heavy loads of paper at frequent intervals. Continuous feeders were better adapted to the large cylinder presses and therefore were installed more widely at first. Small cylinders to which pile-feeders are more frequently attached did not appear until ten years later. Nor were platen presses machine-fed until 1910. Thus it was the continuous feeders, the loading of which was laborious, that gave first concern to the press assistants.

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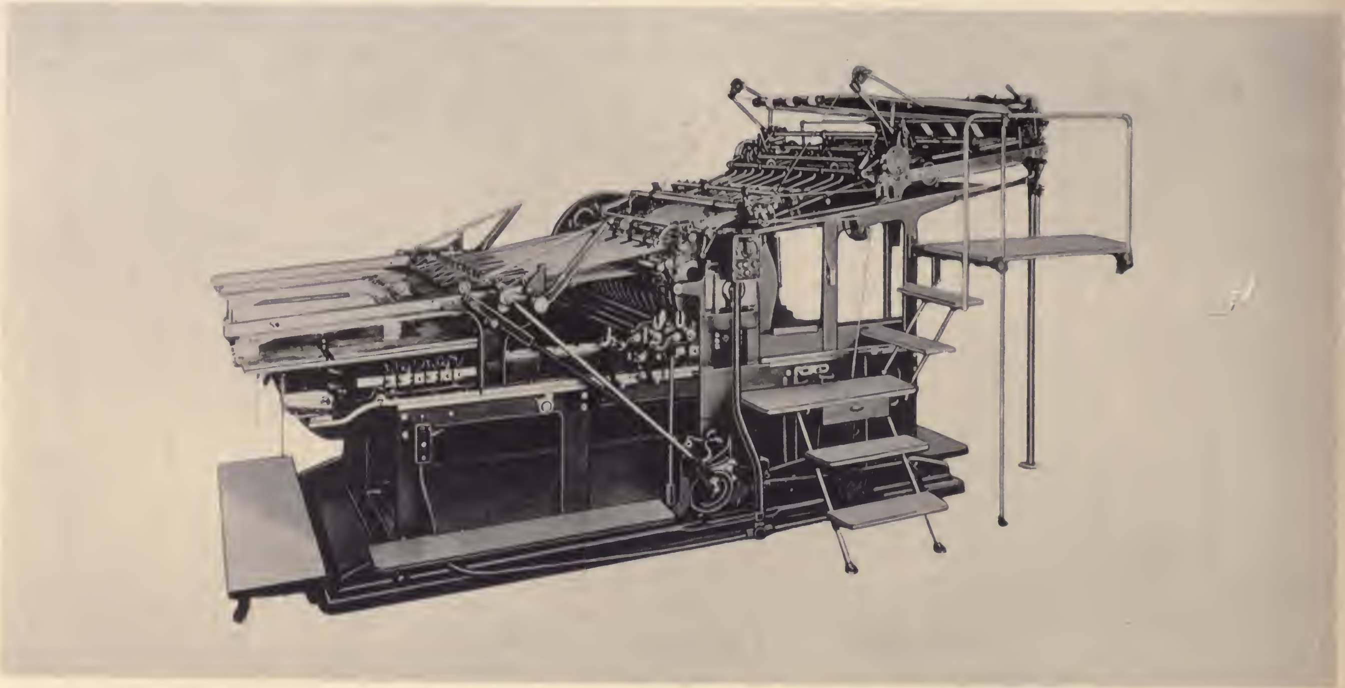
[10] *Op. cit.*, pp. 88–90.

But the early twentieth-century struggles of press assistants were against pressmen as well as against mechanical feeders. In fact, little attention was paid to the automatic feeders at first because so few of them were in use. But pressmen so often fed their presses themselves that, almost at once after the formation of the International Printing Pressmen and Assistants' Union, in 1896, a rule was made forbidding a pressman to run his cylinder press without an assistant in cities where there was an assistant's union. For a time the international union rule that provided for an assistant to each press seemed to be a veritable rock of Gibralter; but in the end it tottered, lashed as it was by a furious conflict over automatic feeding.[12] Today, its skeleton form casts a black shadow over the destiny of press assistants as they become less and less necessary in the pressroom.

Protection of pressmen from overstrain was the next step of the international union in the adjustment to the new machines, and the restriction of the number of presses over which a pressman should have supervision was begun "for health reasons" in 1901. Thereafter, platen pressmen and feeders sought relief similar to that which was being given to their seniors on the cylinders—for the pressmen against overstrain, and for the feeders against pressman-encroachment upon their occupation of feeding. Apparently, the need of the juniors was fully as great as that of the seniors, but in their field, where anyone who took a notion could set up a platen press in his bedroom, open shop

[11] Push fingers have been replaced by suction fingers since 1920.

[12] This rule is quoted in full in the succeeding chapter, p. 131.



LARGE FLAT-BED SINGLE-CYLINDER PRESS WITH AUTOMATIC CONTINUOUS-FEEDER ATTACHMENT, SHOWING THE SIX STEPS UP WHICH PAPER IS CARRIED FOR LOADING

competition was felt to be too keen to warrant placing restrictions upon union men. The troubles of these job-press workers continued until they were heightened many fold by the invasion of the job-automatic cylinders. We shall return to them later in the narrative.

A number of events clustered about the year 1907 which play their part in this story of interaction between machines and men. The eight-hour day was won for union composing room and pressroom workers after a long and unique struggle between the International Typographical Union and the United Typothetae of America. The contrasting developments in New York and Chicago, which have been discussed heretofore, gathered their respective momenta at this time. In New York, the compositors, strengthened by a five-year closed-shop agreement with the newspaper publishers, converted non-Typothetae members, as well as the public, to their cause. Periodical publishers in 1906 held it uneconomical to allow the struggle to precipitate a strike. One of them explained that a strike would cut off profits of more than $20,000 a month in order to save about $500 a month—his estimate of the cost of meeting the union demands. By autumn of 1907 all but two of the leading New York offices were running on an eight-hour schedule with union workers.[13]

This struggle over the eight-hour day stirred commercial employing printers to action throughout the United Typothetae of America. It developed in 1912 into a division between those who would treat with the unions and those who insisted upon maintaining an open, if not an anti-union, shop.

In New York, a printers' league was established declaring one of its main objects to be that of collective bargaining on a closed-shop basis in matters of wage scales and shop practice. While an open shop section was also formed, it did not flourish in New York as it did in Chicago where employers were freer from the disadvantages of union opposition.

In Chicago, as we have seen, the Typothetae had been harassed by the battling feeders who at last came into the international union. They had also been near exhaustion when the compositors called off their long strike. So, despite friendship

[13] Powell, Leona M., *History of the United Typothetae of America*, p. 70.

with the pressmen who had worked with them in the feeder problem on the one side and had kept to their contract when the compositors were warring on the other, these employing printers held fast to the open-shop principle above everything else. Consequently, while the Franklin Division of employers was established in Chicago to treat with the unions, the open-shop contingent took deeper root.

The New York Branch of the Printers' League of America, organized in 1907, played a major rôle henceforth in the negotiations with the unions in book and job printing. Impending struggles over increased use of automatic machinery were at least partially foreseen and the intention was to minimize them by friendly discussion and contractual agreements. In retrospect it is disappointing to see that what the league really developed was a program based upon exigencies instead of a long-time plan which, it is now realized, the industry must have.

"Why should one man to each feeding machine be necessary?" was the first question which the New York printers' league set out to answer. Eager to take advantage of automatic feeding, and feeling more or less bound to do so by competitive conditions the league found itself face to face with the press-feeders' Franklin Union No. 23. In August, 1907, a conference was arranged between representatives of both sides for discussion of this question upon which action had already been taken by the international union and written into their law.[14]

At first, the opposing views were tossed back and forth in an atmosphere of good humor. Employers proposed that each press assistant tend two automatic feeders except where the job would be physically too hard. The union representatives, visualizing lost jobs for some of their men, urged that although the machines took over the repetitive work the new responsibilities that they incurred made a man to each press as necessary as ever before. Days and nights of discussion ensued that grew warm, and then hot. League records charge that the union developed a technique of procrastination which branded them as lacking in honor; that the officers failed to meet definitely-set appointments, preferring to evade the issue so that the international union would have to take the responsibility of settlement.

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[14] Quoted on p. 131 below.

In March, 1908, New York employers appealed over the head of the local union direct to the international president, George L. Berry, who had swung into office the year before on the "closed shop and an immediate eight-hour day" slogan, provoked principally by the open-shop grip of the industry which Chicago firms held. After a sharp exchange of telegrams the league sent the following letter which is important enough to quote in full:

George L. Berry
President, I.P.P. & A.U.
Lyric Theatre Bldg.
Cincinnati, Ohio
Dear Sir:

After careful consideration of the different phases of the controversy over the question of arbitrating differences as agreed to in the contract made on November 18th, 1907, between the Printers' League and the Franklin Association members of the I.P.P. & A.U. and the Allied Trades Councils, the Executive Committee of the Printers' League has come to the following decision of which you are hereby respectfully advised:—

(1) That inasmuch as the Franklin Association [No. 23] have by their acts unequivocally broken their agreement with the Printers' League on more than one point, and as they continue to do so by act and deed in their daily business with members of the Printers' League, therefore we will make the following recommendation to members of our body:—

a. That no contract exists between the Printers' League and Franklin Association.

b. That League shops may treat with their employees who are members of the Franklin Association of Feeders as individuals and not as recognized Union members.

c. That each employer shall declare such wages for the eight hours of labor he receives as he may deem the help in his employ deserves.

d. That questions of shop rules, individual employment of Feeders' quota of help on any specific class of work or piece of machinery shall be at the discretion and individual judgment of the employer.

e. That should a walkout result from any individual act of an employer, he is empowered to get such help as he requires by such means and from such sources as he sees fit.

(2) That the Franklin Association has, by every means known, fair or unfair, succeeded in the following counts:—

a. In throwing discredit on the principles of the Printers' League.

b. In bringing severe criticism on the League for making a contract with them.

c. In rendering the action of the League for establishing peace in the shops of its membership abortive.

d. In hampering the increase of the League's membership as an organization.

e. In making the employers who are not in the Printers' League cast reflection on the principles of Unionism which the League has so steadfastly advocated.

f. In granting better conditions to shops not in the League than those accorded League shops.

(3) That the Franklin Association, besides the injury it has done the Printer's League of America, has defied the wishes of the International to whom it belongs and has cast discredit on all other branches of the Allied Trades with which it is affiliated by advocating bad principles of Unionism and by giving foundation to the criticism of those who oppose the Unions and who claim that a contract made with a Labor Union is not worthy of consideration by serious-minded men.

(4) Therefore, as the Franklin Association should be censured by the other branches of the Allied Trades, and as we feel that by their action they have not only forfeited the recognition and respect of the Printers' League, but their charter as well, we, the Executive Committee of the Printers' League, decline for our Organization, to hold any further communication with them and to recommend the above to take effect on the day of 1908.[15]

Very truly yours,
Chairman

The league added to this manifesto that it proposed "no drastic measure of retaliation" and that "It is to be distinctly understood that in the formation of a new union from which the League will draw its help to fill the seven hundred positions now filled by the Franklin Association, no reduction of wages nor increase of hours is to be sought by the League."

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[15] Minutes of Meeting of Executive Committee, Printers' League of America, New York Branch, March 13, 1908. Omission in the date appears in the file copy of the league as here shown.

President Berry came to New York and departed, leaving the question, in all its acuteness, unsettled, and freely admitting that he was at a loss to explain the failure of the union to live up to its contract. He called in a national organizer, Crowley, from Buffalo to act in his place. The organizer is reported to have admitted "lack of stamina" on the part of the local union, and a preference to shift responsibility upon an arbitrator "rather than to go back to their organization and report that they agreed to one man to two machines even though they succeeded in getting more money for that man."[16]

The first arbitration of the automatic-feeding-machine question in New York was held in the spring of 1908. Interestingly enough, the president of Typographical Union No. 6, James Murphy, was the mutually chosen arbitrator. Nevertheless, his decision satisfied neither party in the dispute. It provided that an assistant should run one or two machines at the discretion of the employer and that in either case he should receive $18.50 per week. Loath to see the beginning of one-man operation of two feeding machines which the decision fostered, the assistants agreed to open negotiations for a wage adjustment that would run parallel in time with a scale agreement with the pressmen. The arbitrator was asked to reconsider the wage he had set, and a weekly rate of $16.00 was agreed upon for an operator of one automatic feeding machine, and $18.50 for two. The agreement was then ratified by the two contracting parties in January, 1909, setting an inviting stage for the further adoption of mechanical feeders.

Thus the first storm over the man-displacing machines passed over; but not without leaving deep scars on the book and job landscape. The league's conviction of the irresponsibility of the assistants' union, of the narrowness of its outlook and the futility of informal negotiation, had been definitely formed and has probably never abated. *Per contra*, the assistants became convinced that the feeding machine was their enemy and that their officers must fight to save them from being cheated out of their livelihood by it.

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[16] From extracts of Minutes of the Printers' League of America, New York Branch, May 5, 1908.

This fear of displacement by the machine led the press assistants to dictate the practice to be followed by their members in evading the new contract. Before the arbitration no uniform employment policy had been followed, some plants having been able to arrange with their men for an assistant to operate two feeding machines while others employed one assistant to the press. The quality of the work performed probably had something to do with these different practices. But after 1909, according to reliable testimony recently given to the writer:

> When a number of plants at different intervals . . . tried to institute the plan of one man to two machines, when the thing appeared to be menacing to the union so that it would displace men, the union passed an unwritten law that no member of the union can operate two automatically-fed presses. In cases where a member took the chance and ran two presses, he was told that he might find himself under charges, subject to fine, and perhaps lose his card . . . I know one case in a big plant where one man ran two very big presses, for which the man received a considerable bounty over his scale. He was told in no uncertain terms that he must desist, despite his protests that it meant a better living for him—an opportunity to make more money. And so, the condition of one man to a machine exists not by mutual agreement, but because the union for their protection insisted on this condition. And it is only natural that the union try to hold every job possible.

During these years the press assistants tried to secure further protection by the international union, not only against the automatic feeder, but also against the ever encroaching pressmen. It was asserted that not infrequently in a number of cities did a pressman run an automatically fed press by himself, with no assistant. In 1911, therefore, the assistants not only asked for a rule requiring the employment of an assistant to *each* automatic feeder, but, further, that a pressman be not allowed to operate *any* automatically-fed press without an assistant.

Thus advanced the modern dispute between assistants and their pressmen. Circumstances arrayed the pressmen in favor of the automatic feeding machine because it tended to increase their employment, and the press assistants against it because it took their work away.

When it became time to negotiate for new (1911) contracts for New York press work, the league and the assistants' union again had to resort to arbitration. Owing probably to its weakness as a result of the 1907 depression, the union had decided not to tamper with the question of manning the presses. The direct point at issue was the wage scale in which they demanded an increase. Following the $18.50 scale which an assistant now received on two feeding machines, they asked for an increase from $16.00 to $18.00 for one-machine operation.

Both sides thanked the arbitrator for his decision, handed down after a historic three-day hearing of proposals and rebuttals. It consisted of an increase to $17.00 for the minimum scale, specifying no differential for two-machine operation, while the scale for brakemen and tension-men on web presses was raised to $21.00. More will be said soon of these brakemen and tension-men. It is enough at this point to call attention to their being singled out as the most highly skilled of the assistants, a recognition which made logical their significant transfer in 1920 from the assistants' to the pressmen's union.

5. How Important Is the Press Feeder-Assistant

The arbitration proceedings of 1911 are notable. For in the wake of invention they staged the first formal clash of opinion over the importance of the feeder-assistant. Spokesmen for the union of whom Albert Abrahams was the forceful leader, described the duties of assistants, emphasized their increasing responsibility and the demand for accuracy on color-work, pronouncing them to be permanently necessary in the pressroom. It was explained that now that the assistant operates a machine instead of feeding the press by hand he has really become an assistant pressman; that "the pressmen do very little" of the work; that upon the assistant depends the quality of the work, and upon his good will in operating the feeder depends the profit which is made only after 1,000 impressions an hour are reached and for which he was getting no pay. The chief spokesman further urged that the larger sheets and greater speed of the new presses made the feeder's work heavier, that efficiency and scientific management were hitting "the twentieth century feeder." He referred to the assistant's tendency toward tuberculosis, and concluded, "You would not envy a feeder's lot."[17]

The league denied that presses had increased in speed or in size since 1907, and that there had been any increase whatsoever in the general efficiency of feeders since then. Moreover, it said that thousands of dollars of work was leaving New York City "at prices with which the New York printer could not hope to compete." This, it was urged, should be of joint concern to employers and employees. The league also pointed out that girls were being employed in competing cities at wages far below those of New York feeders; and that, since only sixty-one per cent of the New York City shops were organized, they also faced low-wage competition at home.

For us the most significant phase of the league's response was their opinion of the low skill and the diminishing importance of the press assistant. Mr. Driscoll argued for the league, that:

> the work of the feeder is almost entirely of a mechanical nature. Any young man of ordinary intelligence and a fair amount of strength can become proficient in a short time. No long apprenticeship is necessary. . . . Formerly this work was not considered to be a lifelong occupation, but as a preliminary to one of the more skillful branches of the trade.

Mr. Kalkhoff, employing printer, emphasized the function of a feeder as a threshold occupation:

> Efficiency is a word much abused these days and the feeder who is an efficient feeder soon passes forward into the ranks of pressmen, in fact, the feeder is looked upon as an apprentice. If at the end of a period of four or five years he still runs a press, this is due to the fact that he has not proven himself efficient enough to step higher.

He added, however, that "much is due to the tendency to keep feeders in their present position by their fellow workmen, the pressmen."

Charles Francis, whose seniority now makes him dean of employing printers in America, snapped the whip of invention in this historic scene. He opened by stating that the feeders were receiving higher pay for less skill than any other group in the industry; that they demanded this increase in pay by the power they received through amalgamation with the more skilled branches without whose assistance they would probably be receiving twenty-five per cent less wage. Then came the threat that echoed the warning of Mr. Adam, written twenty years before:

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[17] Privately printed arbitration proceedings between the Printers' League of America, New York Branch No. 1, and Franklin Union No. 23, September, 1911.

> The high rate now in force is keeping the feeding machine industry very busy, and this will tend to decrease the employees in this line.

And again:

> . . . the feeder is only one in a chain of workers to produce results . . . should the feeder press this question too strongly, the inventor will take a hand and produce the feeder's work entirely without the feeder.

Mr. Francis concluded his remarks on a note of prophecy:

> . . . I do not believe the cylinder press as it is today is the press of the future. I think myself that before very long you will find that the cylinder press manufacturers will manufacture a press that will take its own sheet, and that the press feeder, if he is anything at all, will become an assistant pressman. The press feeder's work should be only a preparation for a position and not a permanency; we have strong hopes that the establishment at Hale Springs may enable the press feeder to move forward at a greater rate until time will eliminate the press feeder and make him a pressman, the feeding part being done automatically altogether.[18]

And so the second arbitrated battle between employing printers and press assistants ended in an armed truce. Although the conflict was more feverish than the first, and more threatening to the workers, it brought the contestants no nearer to peace. The next years brought abundant ammunition to both sides for the continuance of the struggle. To employers came increased demand for printing and a tide of improved press machinery. To the workers came the war-scarcity of labor, a strong local leader, and continued patronage from the officers of the international union in return for support.

[18] *Op. cit.*

CHAPTER VII

COLLECTIVE BARGAINING AND THE NEW MACHINES SINCE THE BEGINNING OF THE WORLD WAR

The war period furnishes the next landing place in our journey with the struggling press-feeders. True to the traditional linking of industrial invention with war demand for goods, it was during these years that the new mechanical men of the press-room made their most sweeping incursions. Up to 1913 platen and cylinder presses were less than four per cent mechanically fed, but by 1921 sixty-six per cent were fed by machine. In 1913 the high-speed job-automatic cylinder had not appeared on the scene; by 1921 some 2,000 had been installed of which one-fourth were in New York City and one-twentieth in Chicago. In 1913 there were but sixty-five two-color and perfecting presses in use; by 1921 there were nearly 800, of which twenty-seven per cent were in New York City and twenty-two per cent in Chicago.

1. WAR GAINS

This technical progress was not accompanied by widespread displacement of men. On the contrary, it is notable that, along with the mechanical feeders, manual feeders made their most spectacular gains—opportunistic gains though they were, which made their subsequent losses the more painful. Automatic feeding had by no means psychologically, managerially, or technically arrived at the point of totally displacing hand-feeding, nor of taking the place of the other work that press assistants perform. Moreover, printing production was stimulated by the war, and the consequent demand for feeders pressed upon the supply. The relative youth of these workers together with their semi-skill made of them a group that was "easily drawn off by war wages to the shipyards and to other war work," and they were in addition, more likely to be unstable and "radical." Trouble with the feeders' unions in both New York and Chicago was especially acute, resulting in strikes and yielding only to settlements very advantageous to the unions, in the shape of higher wages and agreements for further advances on the basis of increase in the cost of living.[1]

Thus the old grievance of the feeders of New York now came to the fore. Although the open demand from the officers was for higher wages, it was accompanied in their own minds by the determination that one man should not operate two feeding machines. When they appealed for help to the War Labor Board their scale was increased even more than that for pressmen. And when Charles Francis, New York employer, complained to the board that Franklin Union No. 23 refused to live up to its agreement to operate two automatic feeders, there was no response from the board.

It will be recalled that the Murphy decision of 1909, which for an indefinite time set the precedent for an assistant's operation of two automatic feeders at a higher scale of wages, made no distinction between the two kinds of feeding machines. At this time, however, the union, strongly led by the president, James J. Bagley, a web-press brakeman, directed its objections specifically against the continuous feeding machine which required frequent loading of from 50- to 100-pound piles of paper carried up 6 steps to the feed-board—about one ton of paper a day. Although Mr. Bagley said he was not contending against the operation of two pile-fed presses by one man, he nevertheless pointed to the rule of the International Printing Pressmen and Assistants' Union, which reads:

> No member of a subordinate pressmen's union shall be allowed to feed his own cylinder press or operate an automatic feeding machine when so attached, nor shall he perform any work in the nature of making ready or preparing a press to produce any printing product without an assistant.

President Francis of the league responded that, while it was a well-known fact that the union had been making every effort to prevent a man from running more than one feeding machine of any kind, it had never before been possible to fix the responsibility for this action upon the officers of the union. He said he now had direct evidence that his foreman had been so instructed by Mr. Bagley.

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[1] Powell, L. M., *History of the United Typothetae of America*, pp. 141–42; *also* Bird, Francis H., "The Cost of Living as a Factor in Recent Wage Adjustments in the Book and Job Branch of the Chicago Printing Industry," *American Economic Review*, December, 1921, pp. 622–42.

Urging the settlement of this vexed problem[2] once and for all, Mr. Francis proposed in June, 1918 that the men be paid $6.00 above the scale for running two continuous feeders and $4.00 above the scale for running two pile-feeders. He emphasized the hardship and inconvenience which the one-assistant-to-the-machine action had caused during labor shortage, and the lack of patriotism on the part of the union in thus restricting production. He expressed confidence that the men would be willing to do the extra work for the extra pay.

Nevertheless the league's insistence upon two-machine operation was considerably weakened by the fact that in some shops employing printers had made separate agreements to employ an assistant on each continuous-feeding machine. Information came to light that one important shop had been obliged to make this concession to prevent the loss of a certain periodical.[3]

2. Post-War Depression and the Shifting of Scenes

Then came forebodings of the post-war depression. The fear of displacement by new machines, of unemployment and economic want shadowed the scene where organized employers and organized workers bargained. The employer thought the union was pursuing the wrong policy in attempting to create more positions in the face of the shortage of men. The union rejoined that it was not trying to create more positions, but that its members were being drafted in large numbers and that it was greatly concerned over what would become of them if they returned from the war in any way incapacitated. It could not be foretold whether they would be able to have their old positions back in any event. The only response that the employer could make to this vital point was that he thought the league would be willing to enter an agreement with the assistants as it had done with the typographers, providing for the return of employees to their old positions.

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[2] The International Joint Conference Council had just been organized for the adjudication of disputes of this kind. It is noteworthy that this dispute was not settled by this council, and that the council remained in existence only a half-dozen years.

[3] Extracts from the minutes of meetings of the Printers' League Section, New York Employing Printers' Association, 1916, 1917, 1918.

It is noteworthy that this suggestion included no provision for the coming depression during which workers would, of course, be laid off. As in other industries, it embraced no plan of orderly adjustment to either or both of the forces which, combined, were bound to deal a heavy blow to the workers. Depression problems for the unions were certain to be complicated by the labor-saving machinery now in use, which this same employer had prophesied nearly a decade before would be progressively installed in the pressroom.

To the impartial observer the relations between employers and their men at this time appear, on the one side, to have been dictated by a hand-to-mouth policy of business competition, and on the other, by a policy driven by helpless anxiety about the future.

The years 1919 and 1920 brought general disaffection and outlaw strikes within the New York branches of the International Printing Pressmen and Assistants' Union. Formidable secession movements took place. The unions' eagerness for the new forty-four-hour week to become effective was perhaps the chief cause of the trouble, but earlier secession movements had also risen out of internal union conflict over leadership which need not concern us here. By 1921, Pressmen's Union No. 51, Press Feeders' and Assistants' Union No. 23[4] and Job Pressmen and Job Feeders' Union No. 1 had come back into the fold of the International under a three-year stewardship.

Thus it was now under the direct aegis of the international union that pressroom workers were getting back to negotiations with their employers. The World War was over; the depression had come, and commercial printing pressrooms were equipped with labor-saving machines as never before. Instead of scarcity of labor there was now plethora; balance of power had shifted back to the employer.

The open-shop movement in New York had almost perished during all of these years since 1907; but the hard-driven war-time bargains had revived it. In 1917, a division had taken place in

[4] The new name for Franklin Union No. 23.

the New York Employing Printers' Association, and an open-shop branch was established to function parallel with the closed shop, or Printers' League Branch. The introduction of the forty-four-hour week in union offices, in May, 1921, coupled with the serious secession disturbance within the international union, brought grist to open-shop mills which prospered for a time and then lapsed into relative quietness again.

In Chicago the forty-four-hour week dealt another body blow to the power of the pressroom unions. Important employers who had continued to coöperate with the unions refused to adopt it and became staunch recruits in the growing open- and anti-union-shop cause. The local typothetae secretaries estimated in September, 1921 that two-thirds of New York and one-half of Chicago book and job production was then under union operation. In 67 other cities, some 3,000 open shops were said to control over 70 per cent of the production.

During the period of internal union strife in New York City, the "white-card" members of the press assistants, who stood with the international union against the secessionists, pushed on with their automatic-feeder contention. They asked also for an over-the-scale wage for color-press feeding because of the greater strain and skill necessary to keep accurate register on color presses.

But the deadlock over mechanical feeding proved to be as solid as ever. No league-union agreement could be made except to set a basic scale for hand-feeding. Consequently, when in December, 1921 an agreement on shop rules and scales between the league and six reëstablished local unions was published,[5] the cylinder-press assistants were not included except for hand-feeders. A note explained that no shop rules or complete scales could be given for the press assistants' union because of the unsettled dispute over them. This six-fold contract with unions in composing room, pressroom and bindery was effective to October 1922, subject, however, to reopening and arbitration each six months during that period.

[5] New York Typographical Union No. 6 and Mailers' Union No. 6 of the International Typographical Union; Printing Pressmen's Union No. 51 and New York Job Pressmen and Job Press Feeders' Union No. 1 of the International Printing Pressmen and Assistants' Union; and Paper Cutters' Union No. 119 and Bindery Women's Union No. 43 of the International Brotherhood of Book Binders.

Before continuing this narrative it is necessary to mention an important agreement for the control of arbitration procedure which was to hold throughout this shop-rules-and-scales contract. In 1919 the New York printers' league had deftly made an agreement with four local unions including those of the pressmen and press assistants which provided for arbitration of all disputes regarding wages, hours and working conditions, and which expressly excluded local union rules not immediately pertinent as well as all international laws enacted prior to this occasion. All differences of opinion were to be decided by a joint conference council to be composed equally of members of the league and of the union directly involved. Appeals from these decisions could be made to the International Joint Conference Council of the Book and Job Industry, whose decisions would be binding. This arbitration contract was to remain in effect from October 1, 1919 to December 31, 1922, during which time it was hotly beseiged.

Before proceeding with the automatic-feeding-machine controversy of which, unhappily, this historical sketch cannot show the end, it is necessary to tell of an important decision of the international union which struck the first of a series of blows at New York Printing Press Feeders' and Assistants' Union No. 23. It will be recalled that brakemen and tension-men on web presses were singled out during the arbitration of 1911 as the most highly skilled of the assistants, and that in consequence they were awarded a higher wage scale. It may also be recalled that Mr. James J. Bagley, war-time president of the union, was a brakeman. These facts illuminate the decision that was now made in 1920 by the international union to transfer this entire group of men from the assistants' to the pressmen's union.

Within a period of one or two years five hundred of the best men, more than one-fifth of the total membership, were extracted from the ranks of the assistants' union for promotion. The reason was not disguised. The favoritism which the assistants had secured from the War Labor Board through direct action had not been forgotten by the pressmen. Moreover, it appears that during the war period the pressmen had suffered from insubordination by the assistants in the process of work in the shops.[6] Thus the edict for transfer was given in order "to keep the tail from wagging the dog," in the expression of the ranks. International President Berry explained that it was "in order to restore the dignity of the pressmen," making it impossible for the assistants to be the dominating influence in the pressroom. The printers' league, from the employers' angle, says that "the real reason was to eliminate the possibility of magazine webs being tied up in case feeders started trouble."[7]

To proceed with our main story, the time was approaching for the expiration of the shop-rules-and-wage-scales contracts with the pressroom unions, at which time, October 1, 1922, a new agreement would have to be made. Clearly the printers' league entered the preliminary negotiations with a determination to establish its contention once and for all that one assistant should run two automatic feeding machines. Nevertheless, almost at the outset an insuperable obstacle was met. This was the question of arbitrability of the law protecting press assistants, quoted above, which had stood on the statute books of the international union for twenty years. Having been enacted prior to October, 1919, when the two-year arbitration agreement was made, the local unions, supported by their International, declared that this law was by this agreement not arbitrable.

The printers' league held that it considered no rules binding upon them which had been enacted by the Printing Trades Council but in which they had had no voice. Moreover, they asserted that the question of the operation of two automatic feeding machines by one man was not covered in the law cited nor in any other known rule of the union, that it was therefore arbitrable under the existing agreement, and that conciliation of the matter was demanded.[8] President Berry's response to this demand, written from Pressmen's Home, Tennessee, was adamantine. He not only declared this subject to be non-arbitrable, but he exhorted the unions to retrieve the wage scales which had been lowered during the depression in spite of increased production.

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[6] All formal agreements on shop rules between the printers' league and these unions have since the war period provided that "An assistant shall do whatever is essential in the judgment of the pressman that will assist in the preparation and operation of the press to which he is assigned."

[7] Letter to the writer from F. A. Silcox, secretary of the Printers' League Section, New York Employing Printers' Association, September 22, 1931.

[8] From the resolution of the Closed Shop (Printers' League) Branch of the New York Employing Printers' Association regarding laws of the international unions, adopted August 22, 1922.

The letter from the president of the international union was considered by all but extremists among the employers to be an ultimatum. Clear-headed advice came from the headquarters of the United Typothetae in Chicago that the New York employers would make a mistake to press the issue further, that they must either take the extreme and probably fruitless step of refusing further to treat with the unions, declaring an open shop, or else enter some joint understanding with the unions that would lead to modification of their international laws controlling mechanization and cognate questions. It was significantly pointed out that, as the unions make these rules for their own protection, employers should create conditions for joint planning before their adoption. That part of the letter which referred to automatic feeding is noted in full:

August 19, 1922.

. . . On the automatic feeder question, in spite of the fact that Berry's statement might be construed as far fetched, it is my judgment that you will not get this question before an arbitrator. The feeders' union have too much at stake—a possible lay-off of approximately twenty per cent of their membership, for them to concede this point, unless it is forced through a fight. My judgment is that this whole problem of the automatic feeders must be worked out along lines similar to that used in the clothing trades for the introduction of the cutting machines. The first step would be to get information through joint investigation, showing what machines can and should be operated by one man, and also determine what machines it is physically possible and economically advisable to operate two machines to one man. This information, it seems to me, is essential before any progress can be made in the solving of this issue. It will then be necessary to work out a plan for the gradual absorption of the men who will be laid off by the introduction of the automatic feeder, and the resulting reduction in force due to operating two feeders to one man. You will get nowhere on this problem until this is done. If, in the face of such a proposal, the pressroom unions continue to insist upon taking an obstructionist point of view, which means merely the quoting of their international law, they will in the long run lose more than they gain, because they will force a number of the plants to get from under this obstruction by operating a non-union shop. Witness the effect of obstructionist policy in Chicago. They have lost the big color-type houses, who are now running non-union, and employing a large number of pressmen and feeders. The pressroom unions took the same attitude in the case of the United States Printing and Lithographing Company of Cincinnati. This company tried for a year or more to get the local unions and the international to take a constructive view of the question of the complement of men to presses. The United States Printing and Lithographing Company is now operating non-union, although for thirty years it had operated as a union shop. The unions could have saved this situation had they been willing to get at the problem along the lines suggested above.[9]

Almost at once the printers' league made a survey in New York as outlined in this letter. Seventy plants, or all of its members who were running two or more automatic-feeding machines, were circularized by questionnaires. Five questions were asked about as follows: (1) How many pile- and how many continuous feeders are in use in your plant? (2) Do any of the assistants operate two of these machines? (3) Would the operation of two machines by one man be practicable in your plant? (4) How many men would thereby be released? (5) Would you be able to use those displaced men on other work?

In the 70 plants there proved to be 481 continuous and 78 pile-feeders at that time. The continuous feeders, it will be recalled, were those against which the union especially protested in 1917 because of the heavier work they entail. Only three replies came for the second question, two of which stated that two machines were run by one man only when double wages were paid, the third that none of their assistants operated two machines.

To the important question regarding practicability, 53 replies were returned, 28 of which said it would be practicable for one man to run 2 machines, 16 said it would not be, and 9 said it would be under certain conditions. The large number of negative and qualified replies to this question is significant. For the most part the explanations point out why automatic feeders have not even yet been universally installed—short-run work for which it does not pay to set a mechanical feeder, the extra space that the attachments require, and the size and weight of paper which must be lifted and moved to position for machine feeding.

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[9] Letter from F. A. Silcox, Director of the Department of Industrial Relations Information of the United Typothetae of America, addressed to G. A. Bowers, Director of the Bureau of Industrial Relations of the New York Employing Printers' Association, August 19, 1922.

Thirty-three firms replied to question 4, stating that a surplus of about 138 men would be created, 17 of whom could be used on other work, leaving a net surplus of 121 men who would therefore be displaced.[10]

On September 14, 1922—a fortnight before the expiration of the existing contract, a conference was held between the printers' league and the pressroom unions to discuss the question of the automatic-feeder clause for the new contract. The league was prepared to make a four-fold proposal to bring the discussion to a point, which was (1) that operators of one pile- or one continuous feeder should receive the basic scale of wages; (2) that $4.00 above the scale should be paid to operators of two of these feeders; (3) that no assistant should operate two automatic-feeding machines on a run of less than eight hours; (4) that no assistant should lose his employment provided he would accept transfer to other work at a scale no lower than that which he had been receiving.[11]

The disappointment of the league's representatives was not only keen but hotly resentful when it became clear at the opening of the conference that no progress whatsoever could be made. President Korn of the assistants' union refused even to discuss the question. He made it clear that it could be settled by the international union only, and that the officers of the international union had supported instructions given by the conference committee of the union that the assistants should hold to the practice of one man to each automatic-feeding machine (no size having been mentioned).

President Umstadter of the pressmen's union offered a temporary solution to this *impasse* by suggesting that the league present its case to the national convention then about to meet. He promised that some action would have to be taken at that time on this recommendation of the union's conference committee. The league tacitly accepted this suggestion but took pains to emphasize the difficulties employers were meeting from out-of-town competition because of "this absurd regulation of the feeders," asserting that an operator on a machine-fed press should be paid less than a hand-feeder because he did less work. The league held that carrying a ton of paper a day to an automatic feeder was not a man-size job, and, in demonstration, they pointed to the operation of automatic folding machines in the bindery to which the tenders carry some three tons of paper a day.[12]

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[10] Digested from the unpublished report of this investigation on file at the Closed Shop (Printers' League) Branch, New York Employing Printers' Association.

[11] Memoranda, Closed Shop (Printers' League) Branch, New York Employing Printers' Association, August and September, 1922.

Consequently, after the four proposals of the employers had been read into the record, once again a meeting was adjourned with no end of the deadlock in sight. Under the circumstances, proposition No. 12 which was brought before the national convention the following week is of particular interest. It read (referring to a letter of support from President Berry):

> RESOLVED that this condition of one senior assistant to each automatic feeding machine on all cylinder and rotary presses shall be uniformly enforced in all local jurisdictions.[13]

Submitted by Charles Korn, President of New York Press Feeders' and Assistants' Union No. 23 and his conference committee, this proposition was unanimously endorsed by the committee on subordinate unions of which Philip Umstadter, President of New York Pressmen's Union No. 51, was chairman, and promptly adopted by vote of the convention, without discussion and with no dissenting voice!

3. The Press Feeder-Assistants Begin to Lose Ground

In retrospect, it is clear that this 1922 convention was the last of the ramparts of the International Printing Pressmen and Assistants' Union behind which the New York press assistants had been sheltered for nearly twenty years. Owing to the deadlock between league and union, wage-scale agreements only could be made in 1923 and 1924, leaving the subject of manning the feeding machines as vague as before.[14] But at length, in 1924, the national convention opened the way for renewed activity.

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[12] Piles of printed matter from which bindery machines are fed very frequently contain smaller sheets of paper, however, than those fed to presses, large sheets which are printed several times "up" having been cut before leaving the press.

[13] *The American Pressman*, November, 1922, p. 115.

The interim was pregnant with sub-surface maneuvers which seem to have marked the beginning of the press assistants' decline. They had insisted too much on the outworn international rule that took no heed of the newly-mechanized pressroom. Their services were no longer indispensable on the small high-speed presses that were daily displacing obsolescent models. Although the disputes had rarely touched definitely upon pile-fed presses under forty-two inches in bed-size, the union leaders had trod lightly here, simply remaining non-committal, because they feared that concessions in these groups would weaken their power in bargaining over the larger presses, which when automatically fed were usually equipped with the continuous machines.

Two tide-turning developments took shape during this period. Together they give evidence that the good will between New York employers and their pressmen was growing at the same time that the breach between employers and assistants was becoming wider. The obstructionist attitude of the assistants was a factor in producing both of these results.

The first of these steps against the assistants was the achievement of a widened wage differential between them and the pressmen. The pressmen had requested that their wage negotiations be held independently of the assistants, and in fact they had made some strike threats in case their wages were not increased to an equality with those of compositors. Pressmen and compositors usually received the same wages but the 1921 depression had made it impossible for the pressmen to maintain the parity.

As the deadlock between press assistants and printers' league made direct negotiation between them impossible, President Berry came to New York to mediate the question of wages. Three months after the resulting agreement was made and signed by the assistants, the pressmen, making known their intention to strike, received through arbitration an award that brought them even with the compositors and made their scale $10.50 a week over that of the assistants. This was a difference of about $3.00 more than had existed almost without interruption since 1908.

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[14] It will be recalled that the five-year survey of 53 New York City plants, 1924-1929, described in Chapters III and IV above was made during this confusion over the complement of men. Exhibit 12, Appendix B, p. 242, sets forth the standard complement of men and the wage scales that were in force in union shops in 1923–1924 and in 1928–1929.

The assistants sharply resented what they still consider was a trick played upon them. They openly protested it. Their agreement had been signed for two years, however, and could not be reopened. Moreover, the most significant point of all is that each time agreements have been negotiated since then, in spite of white-heat contests, the widened differential between pressmen and assistants has remained unchanged.

The second development adverse to the assistants was the employment of pressmen here and there to operate the new high-speed cylinder presses, or "units," without the help of an assistant. For a premium wage a pressman was glad to have complete charge of just one press instead of looking after two upon which assistants were employed. Business agents for the pressmen began not infrequently to make this kind of arrangement with individual employers for their men. When assistants' union officers would protest upon finding this condition, the agent for the pressmen replied that it would be poor unionism indeed to take a highly paid man off a job in order to give a job to a more lowly paid man.

What occurred in 1924 at the convention of the International Printing Pressmen and Assistants' Union undoubtedly sprang largely from these two practical blows which New York press assistants had just received, one of which had taken place almost under the eyes of the president.

President Berry from the platform not only recognized the displacement of hand-feeding by automatic feeding as a benefit to the workers, but at last recommended the repeal of the international rule over which such long-drawn-out battles had been fought. His remarks as reported reveal the political astuteness which has enabled him to hold the office of president all these years. Now obliged to accept the new feeding machines as inevitable, he breathed new, if false, hope into the minds of the assistants, thus holding their support at the price of intensifying the already serious economic and social problem which they represented. Following are his words:

> The subject of automatic feeding machines is one that should be given serious consideration by this convention. It has become a factor in the industry and is of such economic importance as to require some readjustment of our position with respect to feeding presses.
>
> Up until within a few years feeding presses by hand was an accepted and established custom and condition. . . . This has been superseded largely today by mechanical appliances and *it will be but a short time until feeding paper to printing presses by hand will be completely eliminated from our industry*,[15] and it is my judgment that the passage of hand-feeding is good not only for the industry but for those who were confined to this occupation.
>
> The successor to the hand-press feeder has been the assistant—the assistant to the pressman in the operation of feeding machines. *The term "assistant" is a temporary title and it is not far distant when the responsibilities will be so regulated as to place those in charge of feeding machines upon a similar and equal level to that of pressmen*, and it is the judgment of the writer that this will be good not only for the industry but for the membership of our organization.
>
> We have maintained the position that feeding machines should require one assistant to each machine. Obviously this position was arrived at for the purpose of protecting the hand-feeder from unemployment due to the introduction of feeding machines. . . . It is as important that the profits accruing from innovations should be distributed to the welfare and well being of the employees as it is to the employers. We find ourselves in this position, however—that to maintain as a set policy one man to a feeding machine, with the possibility of unemployment eliminated, we would be engaged in a program that would be economically unsound. *It is infinitely more important that the assisant in charge of the feeding machine be given additional responsibility*, and for it be given adequate compensation, *than it is to force upon the industry persons that are not now in the industry and are totally unnecessary in its conduct*. Obviously the pursuance of such a course minimizes the possibility of increasing our own compensation.[16]

President Berry then recommended repeal of the rule requiring one man to each feeding machine on cylinder presses. He advised further that the directors be instructed to help the assistants in conference with employers to work out an international rule to prevent unemployment as a result of repeal, to maintain uniformity of practice and to secure compensating wage scales.

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[15] Italics mine.

[16] From the report of President George L. Berry to the convention of the International Printing Pressmen and Assistants' Union of North America, *The American Pressman*, November, 1924, pp. 109–10. Italics are all mine.

The union convention was sympathetic to the trend of the president's remarks but the delegates decided it to be unadvisable to repeal the rule. Instead, the board of directors was authorized to organize a conference with representative, chartered press assistants' unions to consider "the subject of automatic feeding machines" and "to seek a solution to this controversial question."

The intention as expressed was that this conference should "move progressively in this matter" in order to prevent unemployment, obtain increased compensation for increased responsibility and eliminate "such economic abuses as may exist." Furthermore, committees of twelve were to be appointed in each city where the controversy existed, to be composed half and half of employers and employees, three from each of the pressmen's and the assistants' unions. In case any one of these committees of twelve could not arrive at an unanimous agreement, disputed issues were to be referred to the president of the International Printing Pressmen and Assistants' Union and the president of the Printers' League of America, composing a National Board, their decision to become binding upon the parties involved. In the event that this board could not agree, they were to choose a third and disinterested person to act with them. The decision of the majority of this enlarged board was then to be final and binding. If an agreement was made locally between a committee of the employers and the two pressroom unions, it should not become operative until reviewed and approved by the National Board, composed of the two presidents.[17]

The result of this conference was reported the following year at the national convention. The signatory parties announced that they "frankly recognize the great mechanical changes that have occurred and are now occurring in the manufacture of automatic feeding machines." They explained that they "accept the principle of labor-saving devices as a natural development in the interests of society," but that these devices "should be made responsive, not in the interest of any one group of individuals engaged in industry, but should be made applicable in the distribution of accruing economies." It was then urged that it would be uneconomical "to engage in a radical change in existing conditions, if by such change employment to those who have been engaged in the business these many years would be denied. We, however, are prepared to meet this issue progressively . . ."

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[17] *Ibid.*

In expansion of their request for equal benefits, the conference stipulated that "economies accruing shall be equally distributed as between; First, one-third of such economies to the employer; second, one-third of such economies to the printing pressmen and, third, one-third of such economies to the press assistants."[18] It seems unlikely that this proposal implied disregard of the claim of the public for lower prices, but in spite of non-union competition and the relative expansion of the non-union branch of the trade, the pressroom unions have always strongly opposed the competitive price which tends to cancel their claim upon financial benefits from more efficient production.

In the matter of regulating the duties of press assistants, the conference proposed:

> that whatever regulation with regard to increased responsibilities and enlargement of duties may be found equitable and physically possible . . . it is stipulated that by such expansions *the press assistants shall be given a more liberal and generous opportunity of associating themselves directly with the pressmen*[19] in the preparation and in the execution of printed matter, be it of whatsoever character. It is stipulated that the parties agree that this provision shall not in any form abridge or modify the apprenticeship laws of the I. P. P. & A. U. of N. A.

It was added, nevertheless, that, after investigations as to the physical and mental strain of operating automatic-feeding machines, the conference was convinced that much of the work was such as to require one assistant to each machine.[20]

Convinced that the question of actual displacement of assistants had to be faced if they were to profit by the conciliatory attitude of the union, the league undertook a more extensive survey of its New York shops in December, 1924 than it had made in 1922. To ascertain the practical value of men as against machines, four simple questions were asked of employers, and immediate response was urged as imperative:

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[18] *The American Pressman*, March, 1925, pp. 19–20.

[19] Italics mine.

[20] *Ibid.*

> If you had the privilege of having two automatic feeding machines operated by one man:
>
> 1. On the present basis in your shop, how many feeders would you put on two machines?
> 2. How many feeders could then be laid off?
> 3. Would you probably buy additional automatic machines? How many?
> 4. How many feeders could then be laid off?

Fifty-eight replies to this questionnaire were received which represented 33 per cent of the league members. These plants owned 295 or 57 per cent of all the automatic-feeding machines which had been installed for league members by the manufacturers. The replies brought an estimate of 73 manual feeders who could be laid off if employers could act independently in the matter of having two automatic feeders operated by one man on their present equipment. Furthermore, they would, under these circumstances, buy more machines which would cause the displacement of 48 more men, or 121 in all.

The league estimated on this basis that in all of the union plants, which composed about 80 per cent of all firms represented in the association, a total of 422 men would be displaced. Two hundred and fifty-five would be displaced on the present equipment and 167 more after the new machines were installed.[21]

Toward logical but not too radical progress, the league made three more estimates in consideration of a plan for differentiating between the two kinds of automatic-feeding machines. It was clear that their bargaining power would be strengthened if employing printers could not be charged with wholesale displacement of men, and if they recognized the harder work involved in carrying heavy paper up six unguarded steps to the large continuous feeders. It was estimated as shown above that (1) a total of 422 assistants would be displaced if all union employers in New York City could ask men to run two feeders wherever they chose; (2) this number would be reduced to 341 if each assistant ran either two pile-feeders or two continuous feeders no larger than 56 inches; and (3) that 198 assistants would be displaced if each assistant ran either two pile-feeders or two continuous feeders no larger than 42 inches.[22]

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[21] From an unpublished report of the Printers' League Section, New York Employing Printers' Association, January, 1925.

It seems important to emphasize once again that, according to their replies, by no means all employers would have asked their press assistants to run two feeding machines had they been given *carte blanche* by the union to do so. This fact is easily confirmed by the observation of actual practice in non-union shops as reported in the preceding pages. The main reason as already noted is that job offices do a great deal of short-run work, in many cases so short that it is not worth while even to use the automatic feeder. (Some say it does not pay to set an automatic feeder for less than 5,000 impressions, others put it as low as 1,000. The decision depends partly upon the kind of feeder involved). Short-run work requires much more preparation relative to running time than the long runs—consumed in making ready the form, and in washing and preparing the press. One plant which replied to this questionnaire had 20 continuous feeders but would not choose to lay off any men (or at the most, two) because one man to each press was unnecessary on their short-run work. Several other plants answered in similar vein.

After all this gathering of information that gave time for a calming of nerves on both sides, as well as a basis for rational procedure, it would seem that the new contracts for 1925 between league and union should have shown great progress in the matter of handling their joint problem. As a matter of fact, however, formal progress was still blocked. The only concession which the press assistants would allow to appear in the contract for 1925–1927 was in connection with the smallest of the new job cylinders—the job-automatics. On these little presses the assistants completely relinquished jurisdiction to the pressmen for all black printing. For half-tone and color work the union required the employment of one junior assistant to each two automatics.

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[22] *Ibid.*

The atmosphere, now grown heavy with forced sub-surface concession out of which this first of a series of formal capitulations was wrung from press assistants, has been described. President Berry at the 1924 convention, despite his encouragement to assistants, had also recognized the point of the sword now turned against them:

> It is a cave man argument to say that we will come into the convention and among ourselves decide that tomorrow the cost of the production of a piece of printing shall increase one hundred or two hundred per cent, and expect the employers to sit back and say "We accept it." It is a perfectly silly proposition! They will accept it as long as they are in doubt as to their ability to lick you, and not a second longer.[23]

4. THE IMPACT OF THE NEW JOB CYLINDERS

It was at this same convention that the climax came for job pressmen in their grievance of twenty years. Job pressmen had been the chief organizers of the pressmen's union in the nineteenth century because they were the operators of the pioneer platen presses. And yet, as cylinder presses were installed the job men complained that cylinder pressmen were encroaching upon their precincts and getting more pay for the work than they. In turn, the job-press assistants cried out that their work was being swallowed by job pressmen.

In spite of repeated appeals for relief, these junior workers had never been able to secure statutory protection by the international union because of the competition of non-union shops with which the small union shops, equipped largely with job presses, are always beset. The fact that job pressmen were frequently obliged to run more than the usual number of presses in some cities to enable their employers to compete with non-union shops, forced their representatives at the international conventions to warn against rigidity in shop rules that would crush the unions out of these printing offices entirely. Thus about all that the international union had been able to do was to exhort the locals to stiffen their union strength.

After the strike and secession activities of 1919 and 1920, the job pressmen who at different times had been members both of the pressmen's and of the assistants' unions, joined in the same union, No. 1, with the job-press feeders. But the increased influx of the job-automatics and the small high-speed cylinders together with the general pressure for readjustment of the manning of all book and job presses, brought the job pressmen's grievance into the convention arena for settlement in 1924. As the small job cylinders were now doing much work which had formerly been produced on the platen presses—taking no larger sheet—the job pressmen claimed jurisdiction over them. Yet, because they were cylinder presses, the cylinder pressmen thought they had a claim. Employing printers took advantage of the quarrel by putting up partitions between job and cylinder departments including the job-automatics with the platens so they could pay the lower scale which job-press workers were paid.

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[23] *The American Pressman*, November, 1924, p. 103.

After pointed discussion of practice in Chicago and in other places, the convention decided that all job cylinders should be classified as cylinder presses and that New York job pressmen should become members of Pressmen's Union No. 51 and receive the minimum scale for cylinder pressmen. The theory was that the dispute over just what presses each group of pressmen should run would then be minimized. As one of the pressman delegates put it: ". . . I am willing for the battle to be fought out within the unified union—and may God bless the fellow who thinks he is getting the best of it."[24]

In 1925, then, we see the assimilation of the job pressmen and the job-press feeders by their respective senior unions, No. 51 and No. 23. While some of these men are old-fashioned workers, having spent their lives on hand-fed platen presses, for the most part they are young, new recruits who have no fear of the speed and the mechanics of the new automatic machines. It is chiefly the pressmen on the job-automatics and the small automatic cylinders who have gradually, and without malice, been the force undermining the press assistants. For it is these presses, as we have seen, that are more and more being run by pressmen without assistants in return for a premium wage.

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[24] *The American Pressman*, November, 1924, p. 93. These were the words of John E. Donnelly, reputed to be "the squarest man in the pressmen's union." This was the man who, after being heartily agreed upon both by employers and by unions, gathered the information for the survey of New York plants in this investigation.

While in 1925 the press assistants permitted sub-surface maneuvers to emerge into the contract only in the instance of the job automatics, in the next agreement with the league for 1928–1929 several new provisions appeared in bold-faced type. This contract was signed as a result of a dispute that seethed the more intensely because the employers drove their points so hard. It was not only business depression that made them ask for relief from the exactions of the press assistants, but open-shop and out-of-town competition were alleged to make relief mandatory. The open shops were installing the new high-speed cylinders more rapidly than the union shops, the argument ran, because they were union-free, and for the same reason more and more large periodicals were migrating from New York.

A forty-hour week was being urged by the compositors at this time, but the pressroom unions withdrew this demand for themselves because the more immediate question of the complement of men on the automatic cylinders had grown so complex that it had to be settled. On the job-automatics the union assistants gained the promise of the employers in the new contract that when a helper was used for black work he should be one of their junior members. [25] On the next larger size of automatic cylinders (22″ to 29″) the assistants at last agreed to the employment of one man to two machines. This man was to be a junior member unless "where a senior assistant is displaced by the elimination of cylinder presses upon which he is working, it is recommended that a senior assistant be given preference at the senior scale."

For the largest of the new small cylinders (29″ to 42″), the subject of a conflict which had been the most intense and which required delicate negotiation because of its three-sided character, there was at least a partial clearing. Press Assistants' Union No. 23, after putting the question to a referendum vote of its membership, agreed that one assistant should operate two of these presses when pile-fed. They further conceded that where an odd press of this size existed, and if it could not be combined for operation with a smaller automatically-fed cylinder, this odd press could be operated by a pressman without an assistant.

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[25] This provision was said to have been ineffective, however, because until the present depression the union could not furnish all the men that were wanted on these presses. Whenever this is the case the union, of course, cannot protest against the employment of boys.

There was irony in this capitulation that the press assistants made with their backs forced to the wall. For, at this time when employers agreed with the assistants' union to employ one of their men on every two of these largest automatic-cylinder presses, their published agreement with the pressmen's union which provided for the employment of one pressman to each of these presses without an assistant had already stood since 1925, and continued to stand. The pressmen had taken the position that the trend of the industry toward the use of high-speed presses should be recognized and encouraged, that they were willing therefore to accept the one-pressman-to-a-press operation, with no assistant, for a premium wage of $5.00 over the scale. President Berry of the international union announced publicly that this agreement with the pressmen was an infringement of the jurisdiction of No. 23 and would not be tolerated by the international union. Vice President McHugh came to New York and presumably mediated the matter by permitting the one-man operation of odd presses only.

But greater forces were at work that made these motions little more than gestures. The conflicting sections remained in the respective league-union contracts and they appeared again, unchanged, in the agreements effective until December 31, 1932. In clear contradiction with each other, they give silent but inexorable testimony of the bitter-end war that rages—however much the conflict has been obscured by smoke screens of political diplomacy, indirection, evasion and ineptitude.[26]

Here it is important to emphasize what several times before in these pages has been tacitly observed, that, although the phenomenon stands unmeasured, it is highly probable that the shrinking opportunities of employment for assistants which resulted from all of these technological shifts away from the semi-skilled men was creating for them an ever-swelling displacement reserve.

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[26] These conflicting agreements may be seen in sections 68 and 56 respectively of the current contracts with No. 51 and No. 23 shown in Exhibits 13-14, Appendix B, pp. 244-45.

5. The Situation concerning the Color Presses

Until very recently flat-bed color presses have been manufactured only in the sizes that brought them into the large-cylinder-press group for which no appreciable changes have been made as yet that reduce the complement of men. Moreover, owing to the high production of these presses, both pressmen and assistants who operate them have for some ten years been able to secure wage differentials.

The two-color presses of the small cylinder sizes which have begun to appear may, however, provoke conflict. As yet there is no more than one of these presses on any pressroom floor in New York City which, under the description of "an odd press" in the contracts, enables its operation by a pressman with no assistant. When President Berry in a letter to the printers' league conceded this point, however, he reminded employers that wherever two of these new color machines are operated an assistant shall "of course" be employed. The league, on the other hand, has stated to President Berry and to each of the two unions that, under the provision in their contracts in regard to the introduction of new processes or new machinery, it reserves the right to arbitrate the matter of manning these new color presses.

6. Conflicts over the Rotary Presses

Little has been said so far about the magazine-rotary presses during these long years of conflict over adjustments to technological change, although it will be recalled that they were well launched on the market before the turn of the century. As a matter of fact, as these presses have been improved they have caused some of the bitterest disputes of all. Used almost exclusively for large-catalogue and periodical production, dozens of rotary presses have been moved away from New York City to Chicago and towns nearer New York where their products could be sold at a lower price. The discussion of this migration of printing and of contrasting conditions in New York and Chicago formed a substantial part of Chapter V. This formidable competition which was there described has spurred New York employing printers to drive their demands harder for reductions in the complement of men.

The web-rotary presses are fed mechanically from a roll of paper. Since the transfer in 1920 of New York brakemen and tension-men from the assistants' to the pressmen's union, these giants of the pressroom have, in New York, been almost entirely operated by pressmen. On the whole, the pressmen's union which has so far gained considerably more for its men than it has lost, has shown more readiness to make adjustments to the new machines than have the assistants. In the face of outside competition pressmen have frequently made special concessions to employers if they could in this way hold the work in New York. After the failure in 1926 to equalize working conditions throughout the country through its international union, Pressmen's Union No. 51, in the 1928 contract, agreed to the removal of the second pressman when black work was produced on single-roll web presses which used no labor-saving attachments except the folder.

The press assistants, on the other hand, had stood firmly against the removal of their men from web presses until two events once again shook them out of passive obstructionism. One was the concession just described which the pressmen had made. The other was the renewed utterance of their international president in January, 1928, that the union has no "arbitrary right in the determination of the number of men required to operate presses." Thereupon, in response to one of New York's largest periodical printing firms, Press Assistants' Union No. 23 agreed to submit to an arbitrator the question as to whether their fourteen utility men, working in two shifts, were needed on the seven web presses in this plant. Utility men oil and do odd jobs about the press. William M. Leiserson was agreed upon by both sides to settle the question.

The printers' league, for the employers, presented to the arbitrator both economic and technical reasons for requiring the removal of these utility men. Employment conditions on similar presses outside of New York were cited as making it impossible otherwise for them to compete on an equal basis. A certain large plant in Chicago was mentioned as operating identical presses with fewer men. This would be one more plant which would have to leave New York City if relief was not forth-coming, it was urged.[27] Moreover, pressman witnesses were presented who testified, somewhat reluctantly, that work on these presses would not be discontinued if the utility men were removed.

The union's case, presented by the Labor Bureau, Inc., was again colored by its human implications. These men had been employed in this plant for years (some of them for fifteen years) and had families to support. Dismissal would most certainly mean unemployment, since many assistants were then without work. On the technical side it was argued that production on the Chicago presses was different from that in this plant, and while utility men may not be required in Chicago, they were necessary on the quality of work that was being produced in New York. They suggested that if a reduction of force was imperative for the sake of competition, the utility men were not necessarily the ones who should go.

Dr. Leiserson's decision in this case was important. It was made after both sides had been fully heard, executive sessions held, and plants visited for first-hand consideration of the points at issue. The arbitrator agreed that the case was somewhat blurred by the variations in the work in the different plants. He regretted that this issue was restricted to debate with the press assistants' union and did not include discussion with the pressmen's union as well, over the broader question of the entire complement of men. Nevertheless, under the circumstances, he ruled that the company "is justified in removing the utility men from the presses but it is not justified in discharging them from its employment."

With this as a text, employers and employees were given advice toward a constructive policy for making humane and intelligent adjustments to technical progress. Dr. Leiserson pointed out that:

> The principle underlying the decision is that the employer shall be free to make improvements in methods of production, but that changes shall not be made at the expense of the workers who have been faithfully performing their duties.

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[27] When the union demanded examination of the company's books in proof of their need, the company explained that it asked, not financial relief, but equal conditions of operation with its competitors. On this basis the arbitrator ruled out the union's request.

The final paragraphs of the decision ran as follows:

> No employee would lose his livelihood on account of any improvement, unless the firm were losing and in financial straits, but changes would be made gradually, as fast as other work could be found for him. This might involve some expense to the employer, but it would be a temporary expense which he may legitimately be asked to carry. This temporary expense of making the changes gradually would be small compared to what he incurs when the workers resist improvements for fear of loss of livelihood. It does no worker or the union any good to retain men on jobs that are unnecessary, and if employees were protected against loss of employment by transfer to other work, as far as this is possible, then they must coöperate with the management in making improvements, instead of obstructing changes designed to reduce costs.
>
> The Arbitrator feels certain that if this policy of trying to guarantee the men that their work would not be eliminated until other work was provided for them had been adopted eight years ago, when the employers say the dispute over the utility men first arose, the question would have been settled by mutual agreement long ago.[28]

Both sides were reasonably satisfied with the decision. Because of the very large size of this plant, transfer of the men to other work offered much less difficulty than would have been the case in the average-size plant. The firm said that it could at once take care of half of the fourteen men, and other transfers could without doubt be made in due time. It was explained that the firm had tried to make these adjustments before but could not get the consent of the union. The officers of the union also breathed more easily after hearing the decision, for, while clearly there were now fourteen jobs less for their men than before, direct unemployment had not ensued, and they had not to take it upon themselves to say what they may personally have thought—that these men who were practically unskilled were, some or all, not needed on these web presses.

Two years ago, after the contract for 1929-1932 had been negotiated, several four-color sheet-fed rotary presses were installed in one of New York's few remaining large periodical-printing plants. The conflict over their operation was two-fold and it involved both of the pressroom unions. Since no presses of this size and sort had existed[29] in New York when the current contract was signed, negotiations were entered under sections sixty-seven and fifty-seven of the agreement with the pressmen's and the press assistants' union respectively. These sections are identical. They provide that:

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[28] Decision of William M. Leiserson, Arbitrator, in the Arbitration Proceedings between the Printers' League Section of the New York Employing Printers' Association and New York Printing Press Assistants' Union No. 23, July 19, 1928.

> In the event of the introduction of new processes or new machinery the complement of men required or other conditions shall be settled by mutual agreement before operation, later to be finally determined after a trial period mutually agreed upon. Such questions shall be settled by reference to the standing Joint Conference Committee of the League and the Union.

The four-color presses in question are said to print the covers of a certain national magazine in scarcely more than one-third of the time consumed on the presses they replaced, at a saving to the firm of more than $50,000 a year. The unions, conforming to the policy of the international union that their members should benefit from economies in production, asked for differential wages over the basic scales. The question could not be settled through the joint-council committees of the league and the unions and it was taken into arbitration, separately, as is usual nowadays in matters relating both to pressmen and to press assistants.

The league and the press assistants' union could not agree upon an arbitrator and so a board of three[30] acted in this case. After an extraordinary amount of negotiating between the league and the union on the part of Mr. Lowenthal, the impartial third member of this board, differentials (of $2.50 a week for the first assistant and $1.00 a week for the second assistant) were agreed upon for the life of the present contract which runs until the end of 1932.

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[29] Interestingly enough one of the most contested points in the arbitration of this case between league and pressmen's union was over the perfectly clear-cut point as to whether or not presses like these were in operation in New York at the time the existing contract was signed. The union's insistence that there were no such presses induced the arbitrator, Judge Alfred J. Talley, to require the facts of the case to be laid before him as a necessary basis for making his decision. Investigation found that there not only were no presses similar to this in New York at the time of signing the current contract, but that there were no presses of this size and make on the market at that time.

[30] Leroy E. Bowman for the union, Howard Horton for the league, and Max Lowenthal as the impartial third member.

Judge Talley, as arbitrator for the pressmen and the league, decided that the pressmen should receive $6.00 over the scale for both day and night work, which with the regular $3.00 extra made $9.00 for the night shift.

The number of men to be employed on these presses could also be decided only through arbitration. Moreover, in the case of the press assistants, for which a tri-partite board again had to be summoned, the arbitrators could not agree. The point at issue with the pressmen's union was whether one or two of their men should be employed on each of the four-color presses, the union insisting upon two because of the physical strain involved. In turn, the press assistants' union demanded the employment of three instead of two assistants on each press. Their plea, presented by the Labor Bureau, Inc., rested firmly, not upon their fear of physical strain in case two men instead of three were required to do the work, but upon their fear of unemployment as these great labor-saving machines glowered down upon them.

The pressmen's case was settled first, after a single hearing in June, 1930. The league urged upon the arbitrator the facts of migration of work out of New York, pointing to production elsewhere on similar presses with even fewer men than New York was willing to employ. It was also urged that close study proved conclusively that one pressman to each press could do the required work without excessive strain.

In deciding the case, Howard Horton, sole arbitrator this time, disclaimed any duty to consider whether work "has left or is likely to leave New York, profits or loss to employers, the probable action of Assistants' Union No. 23, the employment situation, right of employees to share in profits due to improved machinery, etc., etc." He pronounced these subjects to be "irrelevant" to the case in hand. The sole issue as agreed, he explained, was whether or not one or two pressmen were "necessary to properly operate" the presses in question. The decision was that these presses "can be operated efficiently by one pressman and without mental or physical strain."[31] It was so ordered, to be effective along with the wage differentials, until the expiration on December 31, 1932, of the present contract.[32]

The contest with the press assistants' union was much more strenuous. As already stated, the union argument was almost entirely social rather than technological. The union urged that it does not oppose improvements in technique but that it does ask "that its members be not forced to bear their full brunt." Pleading that these jobs be not taken away from their men, the union protested that (1) the board's decision to require only one pressman to each press makes it necessary to employ two operators; (2) workers are entitled to an immediate share of the benefits of technological improvements; (3) workers must be protected against increased hazards of technological improvements; (4) human interest and public policy demand that mechanical progress be controlled.[33]

Inspired by the admonitions of Raymond B. Fosdick, arbitrator for the 1929–1932 contract about to be discussed, the league brought to these hearings the result of time studies which it said it had made during four trial runs of the new four-color presses. These tests had been made in turn with the number of men which the union required and with the number which the firm was willing to employ. Data were presented showing the actual time used for each piece of work by each man. The league's investigation showed that where one pressman and two assistants (one operator and one "button boy") were employed, the operator "is idle or engaged in personal activities more than one-quarter of the day," and that if two operators were employed "they would be employed to do work which required less than three-quarters of one man's time," a margin of idle time which would be "ludicrously inefficient."

The arbitration board in this case consisted of Isaac H. Blanchard for the league, Leroy E. Bowman for the union, and

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[31] This decision was based upon the findings from actual analysis of the tasks. During the period of the arbitration the pressmen had agreed to run the presses with the smaller complement of men as a test to see whether either the men or the production suffered. The result was in the negative.

[32] From briefs and decisions filed with the Printers' League Section of the New York Employing Printers' Association.

[33] *Ibid.*

Morris Llewellyn Cooke as the impartial member. After protracted meetings following the formal hearings, and finally after partial misunderstanding, the majority opinion which ruled was signed only by Mr. Cooke and Mr. Blanchard. The decision was in favor of the league which, together with the victory over the pressmen, gave the firm authority to employ three men instead of five on each of its new four-color presses.[34]

The opinion which accompanied this dictum was in consonance with that of Mr. Fosdick and should have given further pause both to league and to union. True to a sense of grave responsibility to an ever-changing society, the board explained that it had not been able to come to a decision totally on the basis of time studies. "Too many values, human and otherwise, which should be taken into consideration elude such mechanical devices." The arbitrators said they had informed themselves in regard to previous disputes between league and union and were impressed by the increasing frequency with which the accustomed method of settling them had been considered inadequate:

> If the employer-employee relationship is what it is supposed to be—and what in many instances it actually is—it must be in a way as difficult for the employer to face some of the immediate implications of technological change as it is for the employee to cope with the unemployment that frequently results therefrom.
>
> Your Board admits the force with which this line of thought must affect any one charged with reaching a decision in such a matter. However, the menace of technological unemployment has been developing in full view of the printing industry of New York City during a decade or two. Without attempting to assess the relative responsibility of the two sides therefor, it must be admitted that there has been practically nothing done in your negotiations to stress these danger signals and to come to grips with the situation thus created. In fact were it not for the current widespread unemployment it seems possible that the question of the employer responsibility to carry employees not otherwise needed would not have been raised.[35]

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[34] There was provision, however, for the reopening of the question of the number of operators to be employed in case "the press should be re-equipped so as to handle in excess of 16,000 sheets in eight hours."

[35] Majority opinion in the arbitration proceedings between the Printers' League Section of the New York Employing Printers' Association and New York Printing Press Assistants' Union No. 23, August 14, 1930.

And finally, determined to exhort the contestants to set their house of conflict in order according to modern standards, Mr. Cooke and Mr. Blanchard concluded:

> Having decided the immediate case we urge both parties to come closer together and to use their best thought and energy in working out *coöperatively* some scheme whereby the two most important and most rapidly developing needs of the New York printing market may be secured—
>
> (*a*) Security for the workers; and
> (*b*) Lower unit costs for the employers.
>
> These two ends are by no means inconsistent. Both are immediately available to the betterment of every one concerned given the leadership. To make progress along these lines is a duty which you owe not only to yourselves but to the nation and to society at large.
>
> We are living in a new world. "Trading" is rapidly going out of date both in the business world and in the field of industrial relations. The New Day is for those who learn to coöperate. It takes more brains to coöperate effectively than to fight. But the gains are infinitely greater.[36]

7. SUMMARY

So far we can answer the questions which opened the foregoing chapter by saying that technological changes have been made in the pressrooms at the price of continuous and unfriendly conflict. Moreover, that pressmen and press assistants, even though they belong to the same international union in which they attempt to observe the rules of a brotherhood of workers, have in reality drifted apart. The occupations of the pressroom workers have always tauntingly overlapped, but the basis of the unofficial rift seems to lie in technological change. For, whereas mechanical inventions have inspired press assistants to wage a defensive war against displacement, these same inventions have for the most part brought more work and greater prestige to the pressmen. From the illusive heights of being indispensable as press-*feeders*, press *assistants* have fallen to the slough of being increasingly disliked and unnecessary.

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[36] *Ibid.* The minority opinion of Mr. Bowman protested that the data presented at the hearings had been inadequate. He felt that two operators should have been employed on each of these presses until a joint study by league and union, which would probably have taken three months, could be made to ascertain the number of operators actually necessary. He urged that "technological improvement should be made over a period great enough to lessen its weight on the worker," so that the "burden of unemployment should not be borne completely as at present by the union."

Throughout the years of collective bargaining, employers have obeyed the exigencies of a highly competitive industry, while the workers have been motivated by the need of keeping their jobs. From the contract-to-contract struggles there has failed to emerge a plan for the long future which the particular nature of the immediate problems demanded. Press assistants have lost employment ground both by concession and despite their refusal to concede. And, although there is no way to measure its magnitude, it appears in consequence that a displacement reserve of press assistants has been growing—gradually, and therefore relatively unnoticed. In the words of the arbitrator of 1930, "the menace of technological unemployment has been developing in full view of the printing industry of New York City during a decade or two" and yet "there has been practically nothing done in your negotiations to stress these danger signals and to come to grips with the situation thus created." The next chapter carries us on into the epoch-making days of 1932.

CHAPTER VIII

THE CONTRACT FOR 1929-1932 AND PLANS FOR REORGANIZATION

The present shop-rules-and-wage-scales contract between the Printers' League Section of the New York Employing Printers' Association and New York Printing Press Assistants' Union No. 23 was the result of perhaps the most sharply arbitrated contest in all the history that has been recounted. Moreover, the final agreement was signed within thirty days after the Wall Street crash of 1929 announced to a shocked world that the prosperity nourished on speculation was at an end. No wonder the life of the contract has been fraught with dangers!

1. CONFLICT OVER THE NEW CONTRACT

At the expiration of the contract in 1929, the league asked for a $5.00 weekly reduction in the wage scales of all press assistants. *Per contra*, the union asked for a retroactive increase of $7.00 per week on all scales, the full amount to be realized by January 1, 1932. While the matter to be settled was outwardly one of wage scales only, the demands of the respective protagonists cloaked those deeper contentions which were bound to emerge in the course of the debate. The two sides were fortunate in agreeing upon Raymond B. Fosdick as their arbitrator, and the hearings occurred around a great mahogany table in the first fortnight of November, 1929. Each side formally submitted *prima facie* and rebuttal briefs, the Labor Bureau, Inc. again acting on behalf of the union. The sur-rebuttal was an informal, heated, back-and-forth tussle before the man who was to judge.

The assistants' union early in the proceedings made known its six-year-old grievance over the widened wage differential which the pressmen had won over assistants in 1923. The league representatives smiled ironically while the union contended that the pressmen's victory had been an accident which should now be rectified.[1] From his *prima facie* brief, George Soule for the union read out the wage differentials between pressmen and assistants from 1908 to the present time, showing that they had been either $7.50 or $8.00 almost without exception until 1923 when the difference became $10.50. Three of the four dollars in the present demand for an increased scale, therefore, were merely to bring assistants back to their accustomed status with respect to the pressmen.

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[1] In his rebuttal for the printers' league, Mr. Silcox said of this claim that it could "surely not be taken seriously by any one familiar with the processes of collective bargaining . . . It was based, as was the League stand which brought this case to arbitration,

This offensive on the part of the union precipitated a discussion of relative craft skill which at times sharpened into acrimony. An auditor in the corner of that spacious room, who had also listened in 1911 to the discussion of the skill required of an assistant and whether the assistant was or was not a permanent factor in the pressroom, might have thought that time had traveled back seventeen years on its course.

The union in its argument went back to pre-power-press days, to say nothing of the days before automatic feeding when the man did nothing but hand-feed the press. His present duties of operating the automatic feeder, assisting the pressmen in making ready the form and being otherwise helpful about the press, were described in contrast. The change in the nomenclature of this group of workers from "feeders" to "press assistants" was cited as reflecting a change in the nature and importance of this work.

Turning then to the question of permanency, the union argument ran that the press assistant "is not a helper in the ordinary sense, but a full-fledged member of a craft, in which he customarily spends many years of work, if not a lifetime." The chances of promotion were shown to be relatively few. Stating that there were at that time but 140 apprentice pressmen in the assistants' union of over 2,500 members, the point was made that only 5 per cent of the total union group of assistants would become pressmen in 4 years, and most of them never.[2]

Therefore, it was urged, these men employed in a prosperous industry must be paid an equitable wage in their present right:

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upon a firm conviction on the part of the employers that the feeders' scale was being and had been increased all out of proportion to its rightful relationship to other scales in the industry." Mr. Silcox recalled the fact that President Berry himself had come to New York at the time to help the assistants with their negotiations.

[2] The existing rules governing pressman apprenticeship are described in the following chapter.

The press assistants do not ask for more than a very small share of the immense increase of production which has occurred and is still occurring, in their occupation. But they do ask not to be left behind the procession. Specifically, they ask not to be left behind the pressmen and the compositors.[3]

The pent-up convictions about "feeders"[4] and the plans for their elimination were then unloosed by the league.[5] Against a background of data that showed the menace of non-union-shop competition which confronts union employers both from within and from without New York City, heightened by ever wider use of automatic machinery, the obsolescence of the assistant's occupation was emphasized. "The cylinder feeder will soon be as much of an anomaly in the industry as the hand-feed and foot-power operator of a spinning wheel would be in textiles," it was asserted. Moreover, it was added, the feeding job has at most never been more than semiskilled.

The league pointed out to the arbitrator that only one and one-half per cent of the cylinder feeders are now being absorbed into the pressmen's union, that this is evidence that they are "in a blind alley" and, consequently, that their ranks should be split in two ways. It was explained that "the trend of the industry is unmistakably towards one-pressman-to-the-press-operation with the loading up of the paper by paper handlers." The general adoption of this practice would increase the demand for pressmen, he said, making room for those of the assistants who should be promoted. "Many will, however, by force of circumstances go where they really belong, into the Paper Handlers' Union, at a wage scale around $38.00, or $7.50 less than what they are now getting."

The union having presented voluminous data to contradict the league's complaint of destructive out-of-town competition, each side then described from its partisan angle what the actual duties of press assistants are. The futile clash of opinion in this matter and on the general question of skill was perhaps the most significant phase of this raging battle of words. The league put a technical expert on the stand to testify on its side and to show how unskilled press assistants really are. The union threw into the arena a letter of support from its international president, Major George L. Berry, which reiterated the spirit of his remarks at the international convention of 1924. His letter ran in part: "It is obviously true that the hand fed jobs are gradually becoming extinct, but this does not mean that the position of assistants upon presses is becoming extinct." On the contrary Major Berry argued it was likely to survive because of the "great mechanical skill" and "high state of concentration" required on the new machines. "Therefore," he continued, "it can be said without hesitancy that instead of there being a deterioration in the responsibility of the assistants as against hand feeding activities that there has been and will continue to be a tremendous increase."

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[3] From the *prima facie* brief presented on behalf of Press Assistants' Union No. 23 by George Soule for the Labor Bureau, Inc., November, 1929.

[4] This term for the assistants was used throughout the league's argument, as though deliberately to accent both the unskilled and the obsolescent nature of their occupation.

[5] F. A. Silcox who wrote from the United Typothetae of America in 1922, has since then been secretary to the Printers' League Section of the New York Employing Printers Association and has been unflagging in his efforts to deal with the problems presented by the press assistants.

The long sessions finally ended in this discord of outright contradiction. Probably no auditor present, and, I dare say, no contestant envied the arbitrator the task and the responsibility now resting solely upon him. Should New York press assistants be restored to their wonted wage relation with their pressmen by the $7.00 weekly increase, which would imply denial that this work is obsolescent, or should they now be demoted to the extent that a $5.00 weekly decrease surely implied?

The award was a compromise—a $3.00 a week increase to be spread over the three-year period of the contract, that is, $1.00 a week per year. Mr. Fosdick wrote that it had been "a most difficult matter to arrive at a decision . . . because of the confusion which prevails as to the skill required of Press Assistants or Feeders as related to other kinds of work in the industry." He protested that "It is utterly impossible to isolate one craft and make a fair adjustment on facts which pertain to it alone. This you have both recognized through your contrasts of work of this and related crafts."

The arbitrator then tried to give the contestants the benefit of his impartial hearing of their dispute. His impressive counsel not only appears to have strengthened the decision with which the preceding chapter closed, but it inspired an investigation to gather facts which would serve as a basis for a comprehensive grappling with pressroom problems. Expressing his appreciation of the momentous changes in printing which "in the last one hundred years in this country have been met with intelligent statesmanship," Mr. Fosdick described the present conflict as "wholly artificial." "I refer, first," he expanded,

> to the lack of agreement and, if you will pardon me, the apparent lack of knowledge of the relationship of skills required of the workmen in the various crafts in the pressrooms of this city, and to your failure to agree upon a satisfactory method of making the inevitable transition from handwork to mechanical power.[6]

The recommendation was then made that a joint commission be formed to analyze "the duties and requirements of the various positions involved," and to make a "study of the whole problem of changing methods and equipment." This commission, according to the arbitrator, should be composed of representatives of the various pressroom crafts in the city, of the Printers' League Section of the New York Employing Printers' Association and also of the International Printing Pressmen and Assistants' Union. Action of this sort was considered to be of "paramount importance" not only "to both the parties in this immediate arbitration but to the printing industry at large."[7]

The wage scales of press assistants having finally been settled, the league and the pressmen's union were able to come to an agreement more simply, through their joint conference council committee. Significantly, this negotiation resulted in a still wider differential between New York cylinder pressmen and their assistants, which now amounted to $11.50 per week. Pressmen at $60.00 a week, on the other hand, retained their equality with the compositors. Thus, in spite of their plea for equal treatment, the press assistants seemed definitely "to be left behind."

In this struggle over differentials the respective wage scales of senior and junior pressmen and press assistants from 1914 to the present time are revealing:

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[6] Decision of Raymond B. Fosdick, arbitrator, in the arbitration proceedings between the Printers' League Section of the New York Employing Printers' Association and the New York Printing Press Assistants' Union No. 23, November 19, 1929.

[7] A supplemental agreement to the new contract which grew out of this advice from Mr. Fosdick is shown in Exhibit 15, Appendix B, pp. 245-46.

TABLE XVI

Weekly Wage Scales[a] in New York Union Pressrooms 1914-1932

Year	Cylinder Press Department				Job Press Department			
	Pressmen	Maximum Per Cent Increase Over 1914	Press Assistants	Maximum Per Cent Increase Over 1914	Pressmen	Maximum Per Cent Increase Over 1914	Press Assistants	Maximum Per Cent Increase Over 1914
1914	$25.00	.....	$17.00	.....	$19.00	.....	$12.00	.....
1920	$46–$51	104.0	$39–$43	152.9	$40–$44	131.6	$29–$32	166.7
		Per Cent Increase Over 1920[b]		Per Cent Increase Over 1920[b]		Per Cent Increase Over 1920[b]		Per Cent Increase Over 1920[b]
1929	$56–$58	13.7	$45.50	5.8	$47–$49	11.4	$32.00	0.0
1932	$60.00	17.6	$48.50	12.8	$51.00	15.9	$35.00	9.4

[a] Day wages. In general the night wage scale is $3.00 per week over the day scale. This table is drawn from the chart compiled by the Bureau of Industrial Relations, New York Employing Printers' Association showing wage scales for union book and job shops in New York City, 1914–1932.

[b] Percentages are computed from the highest wage in each period.

2. Depression Adjustments

The contract of 1929–1932, wrought out of conflict and in a troubled outer world as it was, has by no means enabled the protagonists to twiddle their negotiatory thumbs in the interim before its expiration. On the contrary, two matters of major importance have taxed them perhaps more than ever before. Chronologically speaking, the first is the revolutionary plan submitted by the printers' league for reorganizing the pressroom with special reference to the press assistants.[8] The second is the depression which at present engulfs the first. These two events—solidly interlocked as they are—shake the very foundations of the existing contract with a force of unpredictable effect upon press assistants.

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[8] The plan in full is presented in Exhibits 18-21, Appendix B, pp. 249-54.

The spring of 1932 found approximately twenty per cent of both pressmen and press assistants receiving unemployment benefits from their respective unions in an atmosphere verging on despair. In round figures this meant some 650 pressmen and 500 assistants. Consequently, with the joint aim to "furnish the local unions an opportunity to provide work for their unemployed members and, at the same time, give relief to the local printing employers of New York City who, equally with the members of the local unions, find themselves involved in this very severe depression which they have not had any responsibility in making," a "supplemental agreement" to the existing contracts was evolved by the league and the union, to become effective "the first fiscal day of the first full fiscal week following March 1, 1932."

Signed by George L. Berry, President of the International Printing Pressmen and Assistants' Union of North America, and by M. F. Hurley for the Printers' League Section of the New York Employing Printers Association, this agreement was to extend over a three-month period. In June, when the period expired and industrial conditions had not improved, the agreement was renewed, a compromise being reached which involved important modifications. The main provisions of the agreement, together with the June modifications which were in force until the second week of September, are as follows:[9]

(1) A maximum of four eight-hour days weekly for pressmen and press assistants. (Changed to a maximum of five eight-hour days.)

(2) Or if the plant prefers to operate a minimum of two six-hour shifts a day at single rates and six days per week, no union member except the foreman may work more than six hours in any 24-hour day. (Abolished.)

(3) The forty-four hour week to remain the basic week for computing adjusted wage rates. (Retained.)

(4) A seven-per cent reduction on the existing basic contract wage

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[9] A fuller presentation is shown in Appendix B, Exhibits 16-17, pp. 247-48. This modified agreement was renewed in September for the remainder of the year. Under an arbitration agreement, except as altered by conciliation it will also control throughout the month of January, 1933 during the negotiations for the new contract.

scale for all pressmen and press assistants. (Reduction increased to about eight and one-half per cent for pressmen and about eleven and one-half per cent for assistants.)

(5) Two presses over 42 inches (large cylinders) may be operated by one pressman with one senior and one junior assistant. (The complement was restored to one pressman and two senior assistants.)[10]

In explanation of this notable agreement, those who negotiated it tried

> to arrive at an understanding which would provide for some degree of adequate relief with the minimum sacrifice on the part of all. . . . We have primarily been concerned all of the time with the human problems involved and the urgent necessity of immediately getting into effect at least an experimental plan of operation which in our mind promises some relief without delay. We have deeply felt that provisions should be made not only for our younger men now unfortunately out of work, but for the mechanics of our industry who have served faithfully through the years and who now because of age find themselves displaced. It is our sincere desire in our extension of this plan that we can eventually through some adjustment in compensation find work for such members, and it is our joint sincere assurance that our respective organizations will work to that end.

The agreement as finally signed appeared to be reasonably satisfactory both to employers and to workers. The seven per cent reduction in the wage scales brought certain comfort to the officers of the press assistants' union because it reduced the grievous differential between cylinder pressmen and assistants from $11.50 to $10.69. President Conway of the pressmen's union commented, "After our experience in expending large amounts of money in unemployment benefits, we find that there is no substitute for a job."[11] He added that the men would not notice the reduction in time as much as would be expected because only about 2,100 out of 3,500 pressmen members of the union were averaging as much as three days a week. As for the league, although it had originally demanded a wage cut of twenty per cent for pressmen and thirty per cent for assistants, it, too, fully endorsed the agreement. This endorsement of the league in the midst of the blackness of the depression was doubtless partially influenced by the larger stakes for which it was and is playing—the reorganization of the pressroom with permanent reductions in the complement of men.

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[10] This shift back to the requirement of one senior assistant to each press is of more than passing interest. The league had considered that the March concession of the union to permit a junior (job press) instead of a senior (cylinder press) assistant to operate on one of these cylinders was a last attack upon the thirty-year-old rule that requires an assistant to each press. The concession is now cancelled in favor of the old rule. The league explains that the change was the result of the unworkability as a principle of having two men doing the same kind of job at different wage scales which the March regulation prescribed. The league says that the new arrangement actually forced the decrease in the wage scale of cylinder assistants from seven to eleven per cent. Even though this is a logical explanation of the change in the agreement between league and union, it is understandable that the assistants' union considers that it has in part won back its lost ground.

[11] *New York Times*, March 4, 1932.

3. The Plan for Reorganizing the Pressroom

Following the advice of the arbitrator the supplemental agreement to the contract for 1929–1932 provided that analyses should be made by the printers' league and by each of the pressroom unions of equipment and the complement of men needed to operate the presses; also of ways and means of absorbing displaced men.

The league completed the first part of its investigation in the summer of 1931. It consisted of a comprehensive survey of pressroom equipment in New York City, both in union and in nonunion establishments. The second part of the inquiry which is now under way is technically far more complicated than the first—that of analyzing pressroom performance by separate tasks in order to discover what skill is required and what the complement of men should be.

The unions have thus far made no investigation and have submitted no plan of procedure toward meeting the problem of displacement of men.

Under date of August 5, 1931, the league submitted a report of findings thus far made, together with its program of reorganization, to President Berry of the International Printing Pressmen and Assistants' Union. In his letter to President Berry which accompanied the plan of the league,[12] the secretary, F. A. Silcox, referred to the "serious character" of the situation in New York City, "which, already cumulatively serious in its effects on union plants . . . has been tremendously accented by the depression and the ruthless cut-throat competitive conditions which now exist." The secretary said the union plants had lost work and that the proportion of union members who are unemployed is larger "than in any previous depression the industry has ever experienced," Continuing, he urged that, "Faced with the constant under-bidding of 25 to 30 per cent from the non-union plants, our plants are seriously threatened in maintaining a healthy financial condition." And still more pointedly he added that, since the employers were bound by contract, they "must continue to pay the existing wage scales or else move away and join the increasing number of successfully operated non-union plants." The situation "challenges the leadership of both the unions and the employers to seriously consider possible remedies," he urged; "it is time for plain talking."

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[12] Appendix Exhibit B, 18, p. 249.

As summarized, the league's proposal was that "Without touching the wage scales[13] it is definitely possible to reduce unit costs in the pressroom by reducing the complement of press assistants now required on automatically equipped presses." Accompanying the letter and the reorganization plan was a summary of the facts which the league had collected in the course of the first of its two surveys. Furthermore, in anticipation of the results of the analysis of tasks, proposals were submitted for the eventual assimilation of the work of press assistants, carrying with it the complete dissolution of their local union. President Berry's coöperation was urged in these words:

> Here is an opportunity for leadership which will avoid such alternatives [of moving out of New York City, going open-shop, or reducing wages] and make effective a constructive program. We have confidence in your courage, your foresight and deep interest in the welfare of the industry as a whole and of the members of your organization in particular to meet this problem constructively.

The program of the league consisted of two parts: (1) a five-year plan to meet the changing pressroom conditions; (2) proposals for immediate relief in order to meet present conditions. To prepare the unions for these proposals, it was explained that the comprehensive survey of pressroom equipment in Greater New York

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[13] In spite of this statement events moved so rapidly that temporary wage cuts were negotiated as explained above.

> which has just been completed . . . discloses the staggering fact that of 2,624 plants in Greater New York, 2,381 or 91 per cent operate non-union pressrooms, and of 13,132 presses in New York printing plants, 10,194 or 78 per cent are in non-union pressrooms.[14]

The obsolescence of hand-feeding and the migration of periodical printing out of New York City were emphasized to give further force to the argument that:

> Purely from the standpoint of enlightened self-interest, then, the pressroom unions should join with the fair employers in the establishment of pressroom conditions which will permit:
>
> (1) Retention of work in union shops and continuance of present jobs for union men.
>
> (2) Union organization of non-union shops thereby increasing available jobs for union men.

The league's five-year plan for reorganization of New York City pressrooms follows rather closely what was said or implied by the secretary in the course of the arbitration proceedings that have been described concerning the existing contract between league and assistants' union. In brief, it provides that the one-pressman-to-the-press-unit[15] plan of operation shall now include the larger cylinders—those with a bed-size over 36 inches. And although employers are to be given their free choice between this complete supplanting of assistants by pressmen on these presses, or the employment of a senior assistant with one pressman on each two presses, the development of the league's plan rests solidly on the elimination of union assistants. This is implicit in the next provision which transfers to the paper handlers the most important function of the assistant after that of hand-feeding—the loading up of paper on the presses.

The league included the following suggestions for the reabsorption of displaced assistants: (1) that they cease admitting members to their union;[16] (2) that those assistants who can qualify be inducted into the pressmen's union; (3) that those who cannot qualify be transferred to the paper handlers' union.

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[14] The percentage of union and non-union production of printing in New York City as reported by the Employing Printers' Association to the United Typothetae of America and published monthly is still 80 per cent and 20 per cent respectively. These are admittedly rough approximations and the proportions might be somewhat different were pressrooms considered separately, yet these reports prompt careful consideration of the meaning of the findings in this survey of the league.

[15] This means all single-cylinder presses over 36 inches that are equipped with both automatic feeding and automatic delivery attachments.

Furthermore, greater labor flexibility than has ever obtained in the pressroom for meeting other changes in techniques appears to be the theory behind the league's important proposal for revising the rules governing apprenticeship. This part of the plan forcibly recalls the thirty-year need for solution of the apprentice problem as revealed in the foregoing pages, and for which pressfeeders themselves were groping before 1907.

The new provision of the league is that "a direct system of apprenticeship in the pressmen's union" be established "with age limits 17 to 22 and with educational qualifications of at least 8th grade grammar school." This again appears to point to a disregard of the existence of press assistants, for it means that, contrary to the arrangement existing in this writing, apprentice pressmen need not have been press assistants, but are to be freely selected solely for their aptitude to become skilled men.

This plan follows that of the straight-line apprenticeship of boys in the composing room which was established by the compositors when linotypes were introduced. As we have seen, the problem in the pressroom was always more complicated so long as operation of the machines required more manual feeders than pressmen. It is doubtful, however, whether this fact made the difficulty insurmountable.

The advantages of this five-year plan as set down by the printers' league are as follows:

(1) More skilled men and fewer machine tenders.

(2) Maintenance of wage and production standards.

(3) Absorption with minimum unemployment of men displaced.

(4) Further organization of plants now operating non-union or with non-union feeders.

(5) Economies of operation to keep work in New York City and yet maintain standards of wages and hours.

(6) Fewer blind-alley jobs.

(7) A direct system of apprenticeship as now effective in the composing room.

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[16] This they did ostensibly as long ago as 1925.

(8) Eventual elimination of conflict of interests between pressmen and press assistants.

(9) Better opportunity for extension of educational work in the industry.

(10) Greater stabilization under changing conditions.

The second part of the league's program—leading up to the five-year plan and at the same time providing for immediate relief to union employers in the competitive operation of their pressrooms—is rendered less important so long as the depression measures remain effective. It aims exclusively and specifically at reduction in the complement of men on all presses, drastic curtailment of employment opportunities for assistants being balanced only in part by increased opportunities for pressmen and for those assistants who under the plan will be retained.

In summary and in support of these proposals for immediate relief, the league recognizes that press assistants are more seriously affected than any other workers by the advent of automatic machinery; but it adds that the plan submitted should develop more jobs for the present assistants (1) by the organization of non-union shops which should be possible under "the more reasonable [union] shop rules proposed," (2) by the increase in the demand for pressmen through the one-pressman-to-the-press operation of many of the machines and (3) by "the natural expansion of the industry permitted by economical press operation." It was estimated that these combined improvements for standardization and economy would achieve employment of from 328 to 361 press-feeders per year, or "practically all of the men who will be affected by the modified rules."

Then, recalling the exhortations of recent arbitrators, but without failing to leave a sting as well, the league has concluded its brief for immediate reorganization by reminding that

> with "union-management coöperation" the watchword of industry today, the present situation presents a challenge to leaders on both sides. Can unions and employers coöperate in a long time constructive program which will work a maximum of benefit to all concerned or will the situation be allowed to drift until the union employers are driven by necessity to force relief?

The final proposal of the league in this plan for immediate relief was for the prompt appointment of a joint commission to take care of pressing problems with regard to holding work in the union shops of New York City:

> Provision should be made in the meantime for any fair employer who by reducing pressroom costs can hold a job that would otherwise go to non-union or out-of-town competitors, to present his facts and figures to the commission together with the relief in complement of men and shop rules which is desired. If, in the judgment of the commission, the relief requested makes no unfair demands on the men employed, and if the job can be saved by such action, temporary relief as requested shall be granted for the specific job.

It is obvious after all that has been told in the foregoing pages that, in formulating these plans for immediate and eventual reorganization, the universal distress in the present depression gave organized New York employing printers the courage of their convictions, voiced more than thirty years ago, in regard to pressfeeders. Repeatedly they have urged that automatic feeders render manual feeders unnecessary unless these men were willing to subordinate themselves. This the manual feeders were not willing to do, becoming militant instead of submissive, so that employers have progressively turned to pressmen to take over what remained of press work.[17]

And now in the greatly strengthened bargaining position which for employers has always been one of the certain fruits of business depression, the printers' league proposes that the New York unions of pressmen and press assistants, fathered by the president of their international union, coöperate in eliminating the assistants within five years. The replies of the local unions to this revolutionary but not illogical proposal are still in the hands of the international president, from whom no comprehensive statement has come at the time of this writing.

In the conference between league and unions at this critical juncture in their relations there seems need of establishing a broader base for the union-management coöperation which the league proposes. At the outset the success of the conference would seem to hinge upon establishing several points of fact. First, do open shops really underbid closed shops by as much as twenty to thirty per cent, when both quality and quantity of product are considered? Second, are union men suffering more unemployment than non-union men? Should the two answers be affirmative, is it then probable, even though the complement of men were reduced, that the drive for unionization of non-union shops would be as successful as the league presupposes it will be?[18] Inasmuch as the plan for the reabsorption of displaced assistants depends upon this spread of union control, the question of the probability of its realization is of major importance. Third, to what extent will the pressmen's union be willing to open its doors to all of those assistants who are capable of being pressmen? Can pressmen be made to believe that such a move would be to their advantage instead of to their disadvantage—that it will not jeopardize their own economic security? Upon the attitude of the pressmen in this matter also depends the success of the league's hope for the reabsorption of displaced assistants.

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[17] It is an interesting and significant commentary upon the attitude of employers, if not upon the diplomacy of the officers of the press assistants' union, that the survey of pressrooms as reported by the printers' league in 1931 disclosed sixty-two which were employing union pressmen and non-union assistants or "helpers."

Last, and perhaps most fundamental of all, is the question of what employing printers are able, financially and managerially, to offer in the way of protection of assistants whom they mean to displace—in the event that the five-year plan does not fully materialize. If the league could re-enforce its scheme of reorganization by offering tangible evidence of its intention that the displacement of men shall be relatively painless, a long step would be taken toward establishing a basis for union-management coöperation in the displacement procedure.

Two possible methods of re-enforcement occur to the writer. One would be toward the retention of the men until they can find suitable employment elsewhere, perhaps including facilities for their retraining. The processes of attrition and transfer that are so inherent in pressroom practice would seem to supply a medium for making this retention workable. Another way of assuring protection to displaced men would be by a dismissal wage sufficient to enable them to make their own economic and social adjustments.[19]

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[18] Depression is a time when, historically, unionization has been well nigh impossible in most trades, for reasons that are obvious.

In order to set up some workable protective measure against risk, such as one of these, organized employers may need to explore anew their costs of production with the intention of reducing them. So far these proposals of the league to the unions for lowering unit costs of pressroom performance have referred to direct labor costs only—to immediate reduction in the complement of men, to the lowering of wages or to "going open shop." But wage costs are well under fifty per cent of total production expenditures. It may be that wastes can be eliminated in connection with the purchase and use of equipment and materials and in other non-labor items. The printing industry was the pioneer in this country in its attempt nineteen years ago to find costs according to a standard-cost system. Great difficulties have been met, and the problems of developing a satisfactory cost system are still formidable, but this long experience would seem to make them less so now than before.[20]

The question of costs and margins of profit has long been a bone of contention in the negotiations between league and unions. When employers have insisted upon union concession to enable them to carry on business against competitors, the union representatives have asked for some showing of accounts to prove that this is necessary. Employers have almost consistently refused this request.[21] In one of the more recent negotiations the reply of the employers, supported by the arbitrator, was that their financial situation was not the subject under discussion, that they asked only for relief in order to compete on an equality with their competitors.

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[19] One notable instance of this kind of protection was a sequel to the measures for working out the problem of excess cutters in the Chicago industry to which Mr. Silcox referred approvingly in his important letter from Chicago to the New York Printers' League Branch in 1922 prior to his taking up the New York secretaryship. Final solution of the Chicago cutter problem was made through dismissal wages in 1926. This case was discussed by R. J. Meyers, in "Occupational Readjustments of Displaced Skilled Workmen," *Journal of Political Economy*, August, 1929.

An excellent general discussion of dismissal wages, re-education, etc. is presented by Professor Sumner H. Slichter in "Lines of Action, Adaptation, and Control," March Supplement, *American Economic Review*, 1932, pp. 41-54.

[20] In 1925 Professor David R. Craig published a study of *The Economic Condition of the Printing Industry in New York City* which was an interesting and suggestive attempt to lay a foundation for scientific measurement of the industry's ability to meet wage demands of workers.

[21] In 1920 and 1921 the printers' league denounced as "a fishing expedition" a plan presented for the assistants' union by the Labor Bureau, Inc., which had before been pro-

Although it is obvious that cost analyses and presentation as a basis of negotiating labor contracts in a sharply competitive and unstandardized industry is an exceedingly delicate matter, it is equally obvious that a response of this kind is entirely unsatisfactory and unconvincing to the unions. They know that their employers do not compete on an equality in the matter of rents and transportation costs, for example. They know that it is total costs balanced against total prices received that must be computed in the struggle between competitors who operate under different conditions and produce different kinds and quantities of products. Naturally, the unions, if they can help themselves, will make no more than their share of concessions, but, as is true of workers in other industries, they are left in the dark as to what their share is. Moreover, even if pertinent cost data were available, this question of the share of the income that should equitably go to the workers for a given amount of labor as compared with that which should go to executives and stockholders is, in our competitive society, an almost totally unsolved problem. Consequently, armed trading has been the only remaining procedure.

4. Conclusion

Should employing printers continue to fail to make use of their accounts, in some equitable manner either to convince workers of their general good faith or to strengthen their own proposal for reorganization by offering protection to displaced workers, they would seem to place a serious obstacle in their own

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posed by Typographical Union No. 6. The proposal was that impartial accountants should examine and give a composite report of the 22 months' income of all New York City firms whose annual business was $100,000 or more. These firms were said to include 76 per cent of the commercial printing business in terms of value of sales. After analyses were made the league protested that the findings were fragmentary and unrepresentative, that "they were not directly applicable in wage negotiations for many reasons." This may easily have been the case, but the serious point is that, even though the task is vastly difficult, organized employing printers have not discovered a substitute procedure. After all their excellent achievements in the making of surveys, it is impossible to believe that they acknowledge defeat in this crucial matter.

way. In the present strained financial condition of all industry, it is almost impossible for either employers or employees to be as generous in their dealings as during relative prosperity. Nevertheless, an outline for making permanent changes, as precisely designed as that under discussion, seems to require for establishing a healthy environment for itself some foresighted provision against the risks of displacement of workers which it may entail.

In the event that no progress has been made by the end of 1932 toward the development of sincere union-management coöperation in this far-reaching reorganization program, the negotiations for 1933 contracts will, of course, be greatly complicated. Moreover, the serious condition of the unions in the depression may prove to throw the balance of power in these negotiations strongly on the side of the employers. It will then be important for the league to consider in its bargaining whether victory in the direction of its permanent plan, won by the defeat of resentful unions rather than by more peaceful concession, will in the long run prove to be a victory.

At least one fact augurs for the success of the plan. This is that the league has shown the sincerity of its intentions by considering the work of pressmen and assistants simultaneously instead of in mutually exclusive sections as before. If pressroom problems in this highly competitive industry can be sufficiently isolated from those of the composing room and bindery, a long step toward the goal has been taken in considering them as a whole in this way. If, on the contrary, these problems should prove to ramify throughout the plant as a producing unit, the league will have to be ready to widen still more the scope of its design.

It is clear that these are matters which demand statesmanlike handling by all groups involved. The present era is one in which the very institution of collective bargaining in a society organized around individualism and private profit is hanging in the balance. There has never been a more crucial period in commercial printing than the next five years would at present seem to face.

Chapter IX

SUMMARY, RETROSPECT AND CONCLUSIONS

In the particular segment of the printing industry which we have explored, we discover that the most striking effect of technological change upon the workers is that evidenced by the *impasse* between organized employers and organized press assistants, who, before the depression, were 2,500 strong in New York City.

This *impasse* is now particularly evidenced by the five-year reorganization plan of the Printers' League Section of the New York Employing Printers Association which crystallizes for action the warnings and threats of thirty years. Submitted in August, 1931, the plan aims at liquidation of New York Printing Press Assistants' Union No. 23. Already it may have gained some strength as a result of the present depression. For, since the birth of the plan, pressroom unions have been obliged to accede to drastic reductions in the complement of assistants. What more permanent progress toward its goal the printers' league may make in negotiating the new contract for 1933 is at present unpredictable. As was pointed out in the preceding chapter much seems to depend upon the ability and willingness of employing printers to offer protection to displaced men.

1. Summary

Six points among the findings as to the nature of changes that have led up to this body attack upon press assistance stand out well above the surface:

(1) The commercial printing pressroom has been mechanically transformed during the past fifty years, not only by the replacement of the press assistant's work of hand-feeding the sheets of paper to the press by machine-feeders, but also by the introduction of high-speed automatic presses that increase production. More particularly, these improvements have occurred since 1913. This technical advance has been one of industrial evolution rather than of revolution, for, compared with the linotype which was almost universally adopted in the composing

room within a period of ten years, important changes in pressroom techniques are still being made.

(2) Commercial printing, with the exception of nationally circulated magazines, periodicals, and mail-order catalogues, is characteristically produced for local consumption and in thousands of small, highly competitive offices throughout the United States. This means that the mechanization process on the whole has been widely diffused rather than concentrated in large cities. Consequently, it means also that the factor of labor mobility is relatively unimportant in the advance of commercial printing, as compared with stone-planing, for example, where the hand work that remained had largely to be transferred to the quarries.

(3) The highly competitive nature of the industry has forced reductions in the price of printing to the consumer as the new techniques have brought lower unit costs. The effect which these reductions have had upon profits is unknown, as lower prices have been accompanied by an ever-increasing expansion of the industry that further stimulates technical advance. The printed word is used now in business, in commerce, in economic and social life, to an extent undreamed of in the 1880's.

(4) The man-displacing power of commercial pressroom equipment, relatively speaking, is not high. Unfortunately, exact productivity of workers could not be measured owing to the unstandardized nature of the industry, both in the production process and in the products, but it seems safe to say that one man on the new machines of the past twenty years can at most produce no more than two or three men produced before that time.[1]

(5) Despite these improvements in machinery, the number of workers employed in book and job printing, instead of decreasing has steadily grown. This appears to be explained by the

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[1] This appraisal of the degree of man-displacing power of machinery is based upon the judgment of Professor Barnett (George E. Barnett, *Machinery and Labor*, Harvard University Press, 1926, p. 132) after his analysis of technical change in four industries. Professor Barnett found that a man on a linotype or on a semi-automatic bottle machine could produce about four times as much as he formerly could do by hand. He appraised this power of machines to displace men as low by comparison with the stone-planer which enabled a man to do eight times what he had done before, and with the Owens bottle machine which increased per capita productivity eighteen times as compared with the hand blowing of bottles.

relatively low man-displacing power of the new machines accompanied by an important increase in the consumption of printing.

(6) Moreover, in New York City, where technical advance has exceeded that of the rest of the country, and where hand-feeding was reduced from seventy-five per cent to fifteen per cent of all press-feeding during a period of sixteen years, the membership in the press-feeders' or assistants' union did not fall but remained practically stationary for twenty years. And with this the membership in the union of highly skilled pressmen actually rose thirty-three per cent.

Underlying these first, and relatively favorable, effects of technical progress upon the workers are more elusive facts. They detoured this investigator into fifty-three New York City pressrooms where the actual changes in men and machines for the five-year period before the depression were recorded in detail.

These fifty-three shops yielded evidence that despite the numerical increase in workers, employment opportunities in the pressroom are definitely shrinking, particularly for press assistants. As the new-model presses replace the older models, actual reduction in the total number of pressroom workers seems preventable only by continued expansion of the industry—in the future as in the past—which, of course, cannot be predicted. In spite of past expansion, the mechanical displacement of the hand-feeder and his transformation into a press assistant has induced a tendency toward gradual absorption by the pressmen of the assistant's remaining odd duties about the press.

Consequently, in the fifty-three plants studied, the five years of change brought a six per cent net displacement of press assistants and an eight per cent net increase in employment for pressmen. Improved pressroom techniques, therefore, instead of displacing skill, were discovered to stimulate an increasing demand for skill and to displace unskilled or semiskilled labor. Interestingly enough, moreover, this trend was somewhat more evident in non-union than in union shops.

The discovery of a six per cent net displacement of press assistants did not bring with it, however, the identification of any specific group as the particular sufferers. And, although the displacement of semiskilled labor was incontrovertible, it proved impossible, because of the lack of employment records in shop and in union, to single out many individuals as the ones displaced.

Moreover, the question as to whether displacement of these men was followed by unemployment was not to be answered by surface observation. Aside from the absence of employment records, the main secret of the difficulty in finding displaced men proved to lie in shop practice—in a generally high labor turnover which seems always to have been inherent in the industry, so that the processes of attrition take care of many of the immediate adjustments of workers to the new machines.

Furthermore, within the pressroom the change in printing processes is such that transfer of men, both of pressmen and of press assistants, from old to new occupations, has usually been the most convenient practice as the industry expanded. With exceptions, when presses become automatically fed manual feeders in good standing have been transferred from hand-feeding to become general assistants to the pressmen. Thus, except as a displacement reserve of scattered individuals gathered, there was group displacement from the *process* but not from the industry.

To be sure, plants fail, merge with one another, or move out of town where scarcity values are lower and the unions are weaker, and these changes are bound to throw men out of work. But even these movements were found to be numerically smaller than it had been thought, two-thirds of the firms in New York City having remained in business and under the same management at least as long as the five-year period for which this analysis was made.

Moreover, it was discovered in these plants that a degree of synchronism exists between the discarding and the installation of presses. Within the practice just described, such synchronism could scarcely fail to result in fewer dismissals than if new machines had not with some promptness taken the places of those discarded. As an actual matter of fact, the new machines having been installed for the regular work, it looks as though employing printers have too frequently retained their old equipment to fill the hoped-for extra orders which they may or may not have received. This means that a substantial amount of pressroom machinery has stood idle a good deal of the time. It means further that the growing labor reserve has been swollen by old-fashioned workers, chiefly assistants, who were hopeful of intermittent employment as they failed to be retained or as they were sloughed off through the processes of attrition.

The question whether trade unions can shield their members from the impact of machines to which unorganized workers are freely exposed brings us back to the present struggle of the New York press assistants' union.

When we recall the adjustments of the compositors to the linotype, and the hard-won victories of the shorter working day and of rising wage scales as union composing room and pressroom have been mechanized, there seems little doubt that the trade unions here involved have at least partially succeeded in protecting their members at their changing work. Open-shop employees not only tend to work more hours in the day and at lower wages than do union men, but in the pressroom at least they also work with a smaller complement of men.

But despite these counts in favor of unionism, the questions of relative productivity and relative dismissal in union and in non-union pressrooms could not be decided. Also, no evidence could be adduced to show that more men had been discharged in open shops, although in open as compared with closed shops (1) new pressroom machinery formed a larger proportion of the whole, (2) a smaller crew of men was employed to each press, and (3) the preference for pressmen as against assistants was more evident.[2]

Thus, although the press assistants' union has shared in the benefits of union victories it has not been able to avert increasing displacement of its men. And what is more, despite certain continued usefulness of the assistant in union as well as in non-union pressrooms, union assistants are now threatened with extinction.

The key to this paradox, and to the failure of the assistants' union to protect its members, is not that press assistants have suddenly become unnecessary, but that those who are strongly organized have more or less successfully resisted technological change. In the days of manual feeding these men were indispensable at a specific task that required physical dexterity. As the mechanical feeder was attached, the man who was left was transferred to an unstandardized composite of duties as general assistant to the pressman. In the words of the union contracts, the assistant's job became that of doing "whatever is essential in the judgment of the pressman that will assist in the preparation and operation of the press to which he is assigned."

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[2] It is possible that the greater occupational mobility of labor in open shops, owing to the absence of restrictions which the unions enforce, tended to offset the otherwise greater probability of displacement.

Nevertheless, despite the highly ephemeral nature of the feeding occupation, and the diffused and subordinate nature of the duties which followed it, organized press assistants have been a proud and militant craft union, linked in a common international with the pressmen, demanding, and for a time securing, status and wages disproportionate to their skill. Moreover, these misguided assistants have been supported by their international president as holders of positions of "increasing responsibility" because of the "great mechanical skill" which the new machines require.

By contrast, unorganized press-feeders can only accept in silence their changed status to "helpers," from which some rise to be pressmen while others remain for the rest of their lives at the level of relatively unskilled labor.

Thus whereas it looks as though unorganized press assistants will continue to be employed as helpers in gradually decreasing numbers, it may be that organized assistants will be entirely banished from the New York pressrooms.

Organized employers take the stand that the magnitude of the problems presented by the assistants' union is entirely out of proportion to their remaining usefulness, so that they intend to parcel out their tasks in three directions—to the pressmen, to the paper-handlers, to the porters and wash-up men. Making ready the form, they explain, is the responsibility of the pressman, so that such tasks as the patching up will be done under the direction of the pressman, not by press assistants but either by an apprentice or by members of a floating crew of make-ready men. In case a pressman may be busy marking out a new make-ready while his press is running, a boy, if not an apprentice pressman, can be stationed to push the stop button should mechanical trouble arise. The setting of the automatic feeding attachment, the league asserts, may also reasonably be considered a part, and a very small part, of the pressman's work. A short job of hand-feeding could be done by the pressman or an apprentice. The loading of the paper upon the feeder and the carrying of the printed piles away from the delivery-board are logically the duties of paper handlers. Oilers and porters should oil and wash up the presses.

In so far as this parceling-out process materializes, the New York organized assistants will be bereft even of a semblance of a craft in their own right, and must then follow their jobs in one of the three directions previously indicated, or permanently disappear from the union pressroom. Needless to say they vigorously protest this plan of the printers' league as not only inequitable but as impossible of execution. They have, however, offered no counterplan.

The International Printing Pressmen and Assistants' Union has not yet stated its position in this matter but, in view of the recent exhortations of the assistants by President Berry, it seems safe to believe that he will not readily be in accord with the league's proposal which would cause an important stake of diplomacy to be swept away.

As for the pressmen, although they have frequently been harassed by the militancy and obstructionism of assistants, and although at times they have been even actively willing to see employment opportunities of assistants shrink in favor of them selves, they by no means favor the extinction of the assistants' union or of the assistants' job. They believe an abrupt development of this kind would so increase competition for pressmen's jobs that their economic security would be seriously jeopardized. More thoughtful pressmen are already apprehensive lest the ever-busy inventor will conjure more devices for the pressroom to encroach upon their own work. Moreover, these pressmen are anxious about their economic future in a world that may use radio, telegraphy, and television more and the printed word less.

2. Retrospect

What are the rooted causes of this tragic dilemma of the organized press assistants? Do they lie in the existence of craft unions or in the tactics of employers, or in technological change itself? The present acute situation seems unworthy of this particular industry which has appeared inherently able to make impressive advance with the adoption of new techniques without too abrupt reduction in the number of employed men.

In the attempt to answer these penetrating questions it is all too true that there is no arrangement either in the printing office or in the unions for keeping current account of what is taking place. As in other industries, this omission not only prevents informed and systematic planning on the part of those involved, but renders impossible a just appraisal of the economic and social significance of technological events. Search for a basis for guiding action is materially thwarted, not only by organized business but by organized society as well.

Nevertheless, the need is imperious that we search for light in meeting experimentally the critical problems which confront industry today. In this spirit, rather than in the censorious vein of what "might have been," it may be possible from the fragmentary records that have been gathered in this printing study to point out flaws and omissions in the past which will help to give direction for the future. With this aim let us consider the direct questions: (1) Might the present predicament of the press assistants have been avoided by the exercise of a more conscious industrial and social foresight? (2) What can we find to guide foresight in the future?

Glancing back over the era of modern printing—from the time when manual feeders necessarily outnumbered pressmen, to the present when, as a group, feeders are facing extinction while the number of pressmen grows—the unrecognized and therefore unsolved problems of apprenticeship, personnel relations and retraining appear to have acquired momentum and a more sinister largeness.

The monotonous job of hand-feeding, together with the necessarily slim hope of promotion, has always presented a vocation too drab to invite alert and ambitious young men. From the first it was the less responsible, less ambitious boys who joined the ranks of press-feeders. Nevertheless, the pressmen for their self-protection were induced to encourage the gathering of these occupationally-related boys into what they hoped would be a controllable group under the aegis of their international union. It was an omission of importance, therefore, that neither international union nor master printers moved toward the development of rules governing apprentices by which the ablest of these young men might look toward becoming pressmen instead of devoting their energies to irresponsible unionism.

It will be recalled that the Chicago feeders themselves pleaded and fought for more equitable selection of boys from their ranks to become apprentice pressmen. They wanted a plan which, by paying less attention to seniority, would encourage the promising boys. They wanted to free the all-too-narrow way of inferiors who were chronologically ahead but could not make the full grade to pressmanship. Collective bargaining machinery was, of course, even more primitive then than it is today, but in this case only shortsighted strategy or plain inertia on the part of organized pressmen and master printers can explain the rejection of the press-feeders' proposal, and the failure to submit any plan in its place. The only action taken by the two in the matter appears to have been that of economically clubbing the resentful and riotous feeders into line.

It is a possible assumption that the ramifications of this early sin of omission are at the very foundations of the state of affairs today. There is much to be said for the theory that press-feeders should never have become a craft union in their own right. To all those who took cognizance of what the inventors of automatic feeders were doing, their job as early as 1900 was admittedly ephemeral. Consequently, by holding the numbers of recruits to a minimum and by putting the ablest in line to become pressmen, it would seem as though the press-feeders could have been held in a subordinate position as the industry grew. Nevertheless, only now, in the reorganization plan of the employing printers which we have examined, is there foresighted provision for adjustment to the need for apprentices.

Present rules that govern apprentices, agreed to in the contracts between printers' league and pressroom unions, have remained incredibly irrational. Avenues of promotion are still clogged and the absorptive powers of the pressmen's union are hopelessly weak. In New York City, at best only 3 or 4 per cent a year, or less than 100 out of 2,500 members of the assistants' union, may be appointed as apprentice pressmen. Since 1925 the New York assistants' union has ostensibly been closed to new members. But the organization of some non-union shops and the customary admittance of union men who present their cards from other locals kept the number from declining, at least up to the present depression.

To be among those eligible for selection as an apprentice pressman a man must have been five years an assistant. If and when selected, in order to become a journeyman pressman he must have been four years an apprentice—making nine years in all.[8]

These rules are unsatisfactory to everyone whom they involve. Assistants have persistently asserted that the four-year pressman apprenticeship is not only unreasonably long but that it was arranged to discourage them from aspiring to be pressmen. Employers allege that it is absurd to require five years of assistantship before a man may become an apprentice pressman—that the practice drives away desirable young men who can learn the assistant's job in a mere few weeks. It appears to be fact that some assistants have remained outside the union for this reason, picking up experience in open shops and arriving as journeymen pressmen by a considerably shorter route than their organized fellow workers. On the other hand it is true that many assistants have lost the desire to be pressmen even if they once had it. The natural discouragement of some and the incompetency of others are doubtless partial explanations of this passivity. Employing printers have long asserted, however, that the inequitably high wage scale which press assistants have been able to win, reducing the differential between them and the pressmen to so small a figure, has made assistants prefer to avoid the responsibilities that pressmen must take.

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[8] This refers to cylinder assistants' becoming cylinder pressmen. For job-pressmen apprenticeship the requirement is two years of job-press feeding.

Apparently in fear of an oversupply of men in their ranks, pressmen have been more or less inarticulately obdurate in these controversies regarding apprenticeship.

The process of selecting apprentices itself has increased the sluggishness of the machinery whereby able press assistants are promoted to pressmen. The important responsibility of naming the few assistants to whom promotion is permitted, as well as the entire task of employing and discharging workers, rests with the foreman, a pressman himself, who, except in the larger plants, is himself at work on a press. The recurrent dissatisfaction that press assistants feel against pressmen-foreman soon strikes an investigator who takes the trouble to talk with the men. And it must be said that, allowing for the natural resentment of a jobless man against the direct author of his joblessness, it is easy to see that the sources of friction have increased since the days of hand-feeding.

As the result of the automatic feeder's introduction, the work of an assistant is so unstandardized that its scope depends largely upon the individual relations between the pressman and his assistant. Where relations are friendly and coöperative, the assistant performs some duties that otherwise might be considered solely the affair of the pressman. He is quickly taught how to operate the automatic feeder and he serves the pressmen in ways that, under other circumstances, he might resentfully refuse to do even if asked. When so favored, the assistant may develop a skill that would enable him, with only a little further coaching, actually to take over the responsibilities of pressman. He is a likely apprentice appointee.

On the other hand, if the pressman has a psychopathic jealousy of his job or an unwholesome love of his power as foreman, he may emphasize the mysteries of the press and its feeding attachment, and develop inhibitions in the assistant which may not only foster insubordination but blight his ambition as well. Not a few assistants believe, whether or not it is true, that this kind of misfortune is responsible for keeping them at hand-feeding "until it was too late to learn the autos" as operators, or, what is more serious, that it keeps them from becoming pressmen.

Between these two extremes we more commonly find a relatively fair-minded pressman, with no special training either in foremanship or in handling subordinates, getting on passably well with his assistants but sometimes sorely tried by assistants' incompetence, lack of ambition, or outright insubordination. If it so happens, under these conditions, that the pressman is on the lookout for a job for a friend who is an assistant, incompatibility of the sort just mentioned would be less likely to be reconciled. The assistant who loses his job in consequence may be one of those who, when interviewed in the out-of-work rooms, explains that he quit because he didn't like the foreman, or that the foreman fired him to make room for another man. The fact that favoritism plays a large part in the employment of assistants and in their selection to be apprentice pressmen appears to be an open secret.

The pressman-assistant relationship, moreover, has not been improved by the assistant's heightened respect for his job and the new sense of his own importance. In recent years he has pointed to the merciless monotony of hand-feeding as a lowly job offering too much opportunity for daydreaming that is ruinous to morale. Union officers tell of cases of insanity among their members, seldom failing to add with an accent of pride that the automatic machine "has lifted the feeder up." In this belief in their improved status we have seen that assistants have been encouraged by their international president.

The absence of facilities for retraining press-feeders as the processes in the pressroom changed, has greatly increased the incompatibilities between assistants and their pressmen-foremen. The assistant has been dependent upon his pressman for instruction, or upon picking up information where he could—upon adventitious methods of securing training that required tolerance, initiative and self-confidence which he may or may not have had.

It is true that several of the press manufacturers have for years offered organized instruction for the operation of their machines; but it is also true that applicants have so greatly exceeded accommodations that those chosen as most eligible have usually been pressmen. Again, the School for Printing Pressmen in New York City admits only those few assistants who are fortunate enough to be serving their pressman-apprenticeship.

Neither employing printers nor assistants' union have undertaken to train press-feeders in the new techniques. Employing printers say that their omission is because of their increasing desire to curb the power of the assistants. The assistants' union seems not to have been able independently to arrange for instruction for its members.

3. Conclusions

Does this retrospective glance enable us more nearly to answer the question whether the present plight of the assistants could have been averted? That the absence of systematic retraining and promotion of seasoned press-feeders, together with the lack of informed control of the admission of new men into the field, has increased the labor reserve of assistants and largely contributed to their present plight, is a reasonable reply, even though we have insufficient data to clinch the evidence by proof.

The coming of new young men whose work could begin with the new machines has accelerated the sloughing off of old-fashioned workers. These displaced men—with families, making up a part of our citizenry—had faith in their future. They had learned to think of the pressroom as their permanent source of livelihood. With no guidance in seeking employment elsewhere, therefore, their natural inclination was to continue to think of themselves as assistants even though they took their stations on the periphery of the trade. Indeed all the signposts that they knew pointed in this direction. Employing printers intermittently summoned them to work on older machines retained for filling extra orders even though idle much of the time. Analysis in 1928, for example, showed that some two-thirds of the calls from firms for press assistants that came to the union out-of-work rooms were for hand-feeders.

A further question now arises. Even had it been possible for unions and employers together to develop systematic restriction of entry, facilities for retraining, and wholesome personnel relations that included plans for promotion, to what extent could assistants have been promoted from hand-feeding to assisting, thence into the ranks of the pressmen?

This question provokes others, not only of enlightened leadership on the part of employers and unions, but of the nature of technological change itself. One of the fundamental problems that accompany technical advance today is the question of *tempo*. In what instances is machinery being introduced too rapidly to permit an orderly absorption of the goods produced and of the workers displaced? May there be instances where this introduction is too slow?

In connection with this subject of tempo, the queries which have seemed to lurk throughout the findings of the present investigation are: Why did not employing printers introduce the new machines more rapidly than they did, and would it not have been better had they done so?

It will be recalled that as far back as 1898, before automatic feeders had arrived on the market, the "feeder problem" was forcefully expounded to the trade. Then manual feeders were openly threatened with rapid extinction through displacement by the automatic feeder unless they were willing to take and keep a subordinate position "as apprentices to be pressmen or as unskilled laborers." Again in 1907, and more emphatically in 1911, employing printers cracked the whip of invention anew over the heads of the manual feeders.

But despite all this, up to 1913—fifteen years after the introduction of satisfactory feeding machines—less than four per cent of the presses of the country were automatically fed. Moreover it was not until 1919, *after* the period of war-scarcity of labor when the feeders made their greatest gains, that as many as one-half of the presses of the country became automatically fed.

It must not be overlooked, of course, that it is probably seldom, if ever, that a mechanical device at first absorbs all of the duties of the head and hands it displaces. Its scope of action is more limited than that of the man, and thus it cannot fully take his place. This was and still is to some degree true of press-feeding.

Displacement of hand-feeding by machine-feeding, however, was only one of the two major forms of technical change that the pressroom was undergoing. And, from our present angle of vision, the two changes seem to have been peculiarly complementary in their latent powers to reabsorb, as well as to displace, press-feeders.

It was in 1914 that the small automatic high-speed presses appeared and began their rapid ascendancy among printers. These presses stimulated the demand for pressmen and rendered feeders progressively less necessary. Unfortunately this demand for pressmen was very slow in becoming effective, with the result that assistants felt the ground being cut away from under them. The only helping hand that was offered was that of the officers of their union who had their own positions to guard as well. The result was struggle and tactics of evasion and obstruction, with the assistants winning artificial victories both in wages and in status.

Then, in 1922, came the new small cylinders or "units," which only in the past few years have inspired the one-pressman-to-the-press slogan of employing printers. If these, with the job-automatic presses, had been introduced more rapidly, with the more prompt accompaniment of a plan for manning them that included the weeding out of incompetent assistants and the retraining of the promising ones, it seems, as we now see it, that the demand for pressmen would have increased more rapidly and that the excess supply of assistants displaced by the new automatic feeders would have been more nearly absorbed.

It is conceivable that this quickening of the tempo of technological change would have reversed what did notoriously take place, creating the paradox of an army of semiskilled men that reached the zenith of power after its occupation had become obsolescent. Nor does the paradox cease here. For it is only after some dozen years more, in which assistants have also held their own fairly well, that they are now being asked to acquiesce to occupational extinction.

In this glance backward in search of an answer to the question whether the assistants' plight could have been averted had those involved been able to act in 1900 upon what we know today, three fundamental needs that appeared early and still remain unsatisfied seem to point to an affirmative reply: (1) the subordination and classification of press-feeders by a considered system of apprenticeship such as has been discussed; (2) the retraining of competent press-feeders as techniques advance; (3) the establishment of a tempo of new-machine installations so that the complementary social and economic changes can be made at the same pace.

At this point the question of defining the phenomenon that we are discussing claims attention. In case the end of the press assistants' union in New York is abrupt and painful, which is quite possible under the present plan—omitting, as it does, assurance against the dangers of dismissal—should the resulting condition be labelled "technological unemployment"?

Under the circumstances described above, in this highly mechanized industry which requires a large and increasing amount of skilled labor, I believe the causes of this unemployment lie much deeper than those generally associated with technical advance. They penetrate the problems of management and of union leadership. Here, as in other industries, the expertness and the foresight with which technicians produce machines have been absent in the adjustments of industry and personnel to the use of the machines. The collective bargaining structure has always broken down through escapes such as the open-shop movement. Destructive strife has reigned while, fundamentally, employers and workers were dependent upon each other's support in order to maintain themselves and serve consumers of printing.

Employers have been price-blind and workers have been job-blind. Moreover, despite the social implications of maladjustment and strife such as this, organized society has failed to coerce or consciously to assist or even advise the protagonists to beat their swords into ploughshares. The resulting unemployment is sociological and economic as well as technological. It might even be called *technocultural* unemployment.

For it must be said of the press assistants, that their union appears to have been victimized from the beginning by the failure not only of organized business and organized labor to manage common problems, but of organized society to supply an economic environment in which negotiation could be made effective —in which price-blindness and job-blindness would be not only impossible, but obviously unnecessary. In addition to greater stabilization of industry and provisions for benefits against inevitable unemployment, we would seem to need a "district attorney" to protect the interests of the public in industrial government as much as in the government of city and state.

Employing printers and pressroom unions, by finding an acceptable exit from the *impasse* into which they have arrived, have an opportunity to make a notable economic and social contribution. No phase of the industrial paralysis which has gripped the civilized world these past two years has been more distressing than the discovery that technical improvements were multiplying goods and services for which people lacked the money to pay. Society has been rudely awakened to the necessity of protecting men and women from the devastating impact of technical change as industry advances.

The present collapse is a challenge to more earnest thought than has ever before been given to this problem. Individuals and groups in a position to influence action, whether as participants or as critics, have a responsibility, even in industries with chronically glutted markets, in formulating a policy which will insure maximum protection of human beings against displacement.

The printing industry, on the whole, has been blessed by an absorptive market. It has not been confronted by the problem of disposing of surplus product and surplus man power in the well-nigh insoluble form present in many other industries. Nor does it appear to be now. For this reason we may dare to hope that the industry will find a way to sustain its traditions of leadership by refusing to permit its men to suffer technocultural unemployment.

Individual acquisitiveness alone is not the potent instrument we have assumed it to be in providing workable escapes from economic dilemmas. Moreover, considering the background out of which the "feeder problem" has at last acutely emerged, it is not unthinkable that it brings within itself a reasonably equitable solution. The first steps toward discovering this solution have already been taken by the New York printers' league, even though this body comprises but one-half of the city's union-employing printers. The completion of these steps would appear to depend upon a firm resolve on the part of both employers and men to overcome obstacles by mutually considerate appraisal of the facts involved. Looking toward the future instead of the past, there are many reasons to believe that, jointly, they can find a wise solution.

If this investigation of a specific branch of industry teaches any lesson it is this: Until we devise a method of absorbing displaced workers in self-respecting occupations without serious or protracted periods of unemployment, we cannot speak of social progress and the substitution of men by machines in the same breath. As productivity increases it is becoming more glaringly evident that cultural services are as badly needed as material goods, and that judgment and foresight, informed by the mistakes and omissions of the past, are imperatively required in solving the problems presented by each new technical advance.

APPENDICES

APPENDIX A

TABLE 1.- CUMULATIVE[a] YEARLY SALES OF HAND-FED AND MACHINE-FED PLATEN AND FLAT-BED CYLINDER PRESSES, AFTER ADJUSTMENTS HAVE BEEN MADE FOR SALES OF AUTOMATIC-FEEDING ATTACHMENTS, 1913-1928

UNITED STATES

YEAR	PLATENS		JOB AUTO-MATICS	SMALL CYLINDERS				LARGE CYLINDERS				TWO-COLOR AND PERFECTING		TOTAL	
				Over 22" including 29"		Over 29" including 42"		Over 42" including 68"		Over 68"					
	Hand	Machine		Hand	Machine	Hand	Machine	Hand	Machine	Hand	Machine	Hand	Machine	Hand	Machine
1913	2,607	151		8	5	296	19	451	138	17		50	15	3,429	328
1914	4,741	515	14	22	5	495	36	832	223	18		96	39	6,204	832
1915	6,493	944	96	36	6	680	51	1,037	302	33	2	140	68	8,419	1,469
1916	8,251	1,709	305	48	6	910	73	1,300	424	45	2	210	97	10,764	2,616
1917	9,418	3,388	576	59	9	1,060	122	1,430	565	50	11	245	140	12,262	4,811
1918	8,404	5,919	835	63	12	1,049	246	1,423	729	47	14	264	172	11,250	7,927
1919	7,471	9,439	1,112	63	12	1,134	351	1,502	979	54	17	311	242	10,535	12,152
1920	6,354	14,034	1,611	63	12	1,232	497	1,663	1,310	58	23	407	327	9,777	17,814
1921	7,417	15,707	1,936	64	12	1,308	589	1,714	1,531	54	29	419	356	10,976	20,160
1922	9,612	17,373	2,621	74	12	1,465	696	1,937	1,764	51	46	439	407	13,578	22,919
1923	11,492	19,131	3,820	75	15	1,649	875	2,151	2,012	51	58	450	504	15,868	26,415
1924	12,517	20,687	4,953	80	15	1,760	1,022	2,284	2,202	52	65	468	575	17,161	29,519
1925	13,855	21,885	6,691	86	15	1,813	1,299	2,503	2,363	49	85	488	671	18,794	33,009
1926	14,899	23,038	8,233	86	35	1,872	1,579	2,615	2,528	49	101	472	786	19,993	36,300
1927	15,450	24,148	9,694	90	121	1,903	1,910	2,705	2,672	52	113	464	877	20,664	39,535
1928	16,038	25,254	11,133	88	355	1,956	2,241	2,784	2,840	43	127	462	967	21,371	42,917

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[a] Sales of presses are not shown by years because of the danger of confusing the reader. This table is the result not only of assembling the sales' records of all press manufacturers, by kinds and sizes of presses, but of transferring sales' records of hand-fed presses from "Hand" to "Machine" columns according to the records of sales of corresponding feeding attachments. For this reason, yearly records would show minus quantities for hand-fed presses in all years when the number of feeding attachments sold was greater than the number of hand-fed presses

In the instance of the presses over 68 inches in bed-size the cumulative figure for the entire 16-year period for hand-fed presses in the area outside of New York City and Chicago was a minus figure (-10). This explains the odd result shown in tables 1, 2 and 3 that, by the end of 1928, there remained only 43 hand-fed presses over 68' in the total for the United States whereas there were 53 in New York and Chicago alone. The superficial discrepancy is explainable in two ways: (1) that automatic feeders sold to printers outside of New York and Chicago equipped presses purchased prior to 1913 to such an extent that there were actually more feeders sold than presses, or/and (2) that new automatic feeders were purchased to replace discarded feeders to this extent. While some feeders sold in New York and Chicago probably also fell into one or both of these two categories, these sales were not sufficient to make a cumulative minus figure for these hand-fed presses in these two cities.

There is no way of telling to what extent feeders sold during the 16-year period to equip presses of any size were attached to pre-1913 presses or to replace discarded feeders, but in no other case were there more feeders sold than presses. The early push-finger feeders were not manufactured after 1920 and these were replaced by the improved suction pile-feeders in some pressrooms. To the extent that this was true the growth of machine-feeding in these tables is exaggerated. Inquiry seems to justify the conclusion that the error is probably inconsiderable.

TABLE 2.- CUMULATIVE YEARLY SALES OF HAND-FED AND MACHINE-FED FLAT-BED CYLINDER PRESSES[a], AFTER ADJUSTMENTS HAVE BEEN MADE FOR SALES OF AUTOMATIC-FEEDING ATTACHMENTS, 1913-1928

NEW YORK CITY

YEAR	JOB AUTO-MATICS	SMALL CYLINDERS				LARGE CYLINDERS				TWO-COLOR AND PERFECTING CYLINDERS		TOTAL	
		Over 22" including 29"		Over 29" including 42"		Over 42" including 68"		Over 68"					
		Hand	Machine	Hand	Machine	Hand	Machine	Hand	Machine	Hand	Machine	Hand	Machine
1913		1		31	2	85	38			18	5	135	45
1914	7	2		64	4	178	60	1		32	15	277	86
1915	22	3		88	5	211	85	1	2	54	37	357	151
1916	53	3		125	5	264	116	1	2	70	48	463	224
1917	135	3	1	148	10	314	151	2	4	88	59	555	360
1918	201	3	1	158	23	321	176	2	4	92	69	576	474
1919	269	3	1	160	45	338	213	2	4	80	85	583	617
1920	375	3	1	160	70	318	293	2	4	101	108	584	851
1921	460	3	1	160	98	309	345	2	4	98	115	572	1,023
1922	609	4	1	171	126	347	394	2	4	97	127	621	1,261
1923	782	4	2	178	161	352	447	2	4	83	160	619	1,556
1924	1,048	4	2	176	194	377	474	3	5	85	180	645	1,903
1925	1,402	5	2	177	237	400	520	2	8	82	206	666	2,375
1926	1,758	4	5	181	279	410	556	2	10	78	240	675	2,848
1927	2,058	5	19	178	345	424	586	1	11	71	261	679	3,280
1928	2,378	5	58	189	393	414	626	1	11	66	288	675	3,754

[a] No records are kept of the sales of platen presses by cities. Explanation of this table is made in footnote for appendix table 1.

TABLE 3.- CUMULATIVE YEARLY SALES OF HAND-FED AND MACHINE-FED FLAT-BED CYLINDER PRESSES[a], AFTER ADJUSTMENTS HAVE BEEN MADE FOR SALES OF AUTOMATIC FEEDING ATTACHMENTS, 1913-1928

CHICAGO

YEAR	JOB AUTO-MATICS	SMALL CYLINDERS				LARGE CYLINDERS				TWO-COLOR AND PERFECTING CYLINDERS		TOTAL	
		Over 22" including 29"		Over 29" including 42"		Over 42" including 68"		Over 68"					
		Hand	Machine	Hand	Machine	Hand	Machine	Hand	Machine	Hand	Machine	Hand	Machine
1913		3		29		80	9	12		5		129	9
1914		7		48		145	16	12		16		228	16
1915	2	13		66		182	24	27		23		311	26
1916	9	16		86	2	231	45	38		35	7	406	63
1917	19	17		101	4	262	49	39	6	44	14	463	92
1918	28	17		95	12	255	74	37	8	45	24	449	146
1919	51	17		112	17	278	103	43	11	70	54	520	236
1920	73	17		143	28	292	155	47	15	87	76	586	347
1921	100	17		161	30	297	184	48	16	86	85	609	415
1922	180	17		183	35	315	228	47	31	92	91	654	565
1923	311	17		210	48	353	260	52	36	89	99	721	754
1924	475	17		225	58	386	272	56	36	95	105	779	946
1925	639	18		234	85	396	290	56	46	95	123	799	1,183
1926	841	18	2	237	127	417	299	57	55	94	147	823	1,471
1927	1,025	18	7	237	187	419	310	60	64	85	168	819	1,761
1928	1,219	18	46	238	235	420	319	52	73	81	184	809	2,076

[a] No records are kept of the sales of platen presses by cities. Explanation of this table is made in footnote for appendix table 1.

TABLE 4.- YEARLY SALES OF AUTOMATIC-FEEDING ATTACHMENTS FOR PLATEN AND FLAT-BED CYLINDER PRESSES, 1913-1928

		UNITED STATES						NEW YORK CITY						CHICAGO					
YEAR	FOR PLATENS	FOR SMALL CYLINDERS		FOR LARGE CYLINDERS		FOR TWO-COLOR AND PERFECTING CYLINDERS	TOTAL	FOR SMALL CYLINDERS		FOR LARGE CYLINDERS		FOR TWO-COLOR AND PERFECTING CYLINDERS	TOTAL	FOR SMALL CYLINDERS		FOR LARGE CYLINDERS		FOR TWO-COLOR AND PERFECTING CYLINDERS	TOTAL
		Over 22" incl. 29"	Over 29" incl. 42"	Over 42" incl. 68"	Over 68"			Over 22" incl. 29"	Over 29" incl. 42"	Over 42" incl. 68"	Over 68"			Over 22" incl. 29"	Over 29" incl. 42"	Over 42" incl. 68"	Over 68"		
1913	151	5	19	138	-	15	328	-	2	38	-	5	45	-	-	9	-	-	9
1914	364	-	17	85	-	24	490	-	2	22	-	10	34	-	-	7	-	-	7
1915	429	1	15	79	2	29	555	-	1	25	2	22	50	-	-	8	-	-	8
1916	765	-	22	122	-	29	938	-	-	31	-	11	42	-	2	21	-	7	30
1917	1,679	3	49	141	9	43	1,924	1	5	35	2	11	54	-	2	4	6	7	19
1918	2,531	3	124	164	3	32	2,857	-	13	25	-	10	48	-	8	25	2	10	45
1919	3,520	-	105	250	3	70	3,948	-	22	37	-	18	75	-	5	29	3	30	67
1920	4,595	-	146	331	6	85	5,163	-	25	80	-	23	128	-	11	52	4	22	89
1921	1,673	-	92	221	6	29	2,021	-	28	52	-	7	87	-	2	29	1	9	41
1922	1,666	-	93	233	17	51	2,060	-	23	49	-	12	84	-	5	44	15	6	70
1923	1,758	3	120	248	12	97	2,238	1	26	53	-	33	113	-	8	32	5	8	53
1924	1,552	-	95	190	7	71	1,915	-	26	27	1	20	74	-	8	12	-	6	26
1925	981	-	90	161	20	96	1,348	-	8	46	3	26	83	-	1	18	10	18	47
1926	862	5	55	162	16	115	1,215	2	11	36	2	34	85	-	5	9	9	24	47
1927	887	3	84	140	12	91	1,217	-	19	30	1	21	71	1	6	11	9	21	48
1928	701	5	74	164	14	90	1,048	1	12	39	-	27	79	-	2	9	9	16	36
TOTAL	24,114	28	1,200	2,829	127	967	29,265	5	223	625	11	288	1,152	1	65	319	73	184	642

TABLE 5.- CUMULATIVE SALES OF FLAT-BED CYLINDER PRESSES IN NEW YORK CITY AND IN CHICAGO AS OF DATES GIVEN, BY PRESS GROUPS, SHOWING EXCESS OF NEW YORK OVER CHICAGO

PRESS GROUP		NUMBER OF PRESSES (CUMULATIVE FROM JAN. 1, 1913) AS OF JANUARY 1:				PERCENTAGE EXCESS OF TOTAL PRESSES NEW YORK OVER CHICAGO AS OF JANUARY 1:			
		1915	1918	1924	1929	1915	1918	1924	1929
Job-Automatics									
New York City	. . . .	7	135	782	2,378	-	611	151	95
Chicago	. . . .	-	19	311	1,219				
Small Cylinders									
New York City	Total	70	162	345	645	27	33	26	20
	Hand	66	151	182	194				
	Machine	4	11	163	451				
Chicago	Total	55	122	275	537				
	Hand	55	118	227	256				
	Machine		4	48	281				
Large Cylinders									
New York City	Total	239	471	805	1,052	38	32	15	22
	Hand	179	316	354	415				
	Machine	60	155	451	637				
Chicago	Total	173	356	701	864				
	Hand	157	301	405	472				
	Machine	16	55	296	392				
Two-Color and Perfecting Presses									
New York City	Total	47	147	243	354	194	153	29	34
	Hand	32	88	83	66				
	Machine	15	59	160	288				
Chicago	Total	16	58	188	265				
	Hand	16	44	89	81				
	Machine		14	99	184				
All Cylinders									
New York City	Total	363	915	2,175	4,429	49	65	48	54[a]
	Hand	277	555	619	675				
	Machine	86	360	1,556	3,754				
Chicago	Total	244	555	1,475	2,885				
	Hand	228	463	721	809				
	Machine	16	92	754	2,076				

[a] The corresponding percentages for hand- and machine-fed cylinders are, respectively:

Hand-Fed	22	20	-14	-17
Machine-Fed	438	291	106	81

TABLE 6.- PRESS EQUIPMENT AND MEN EMPLOYED, BY PRESS GROUPS AND BY METHOD OF FEEDING, IN 9 LARGE AND 36 MEDIUM-SIZE UNION SHOPS AND 8 NON-UNION SHOPS IN NEW YORK CITY, 1924 AND 1929

Winter of 1923-1924 and winter of 1928-1929.

PLANT AND PRESS GROUP		TOTAL PRESSES			PLATENS			JOB-AUTOMATICS			SMALL CYLINDERS			LARGE CYLINDERS			TWO-COLOR AND PERFECTING			ROTARIES		
		1924	1929	Per cent change	1924	1929	Per cent change	1924	1929	Per cent change	1924	1929	Per cent change	1924	1929	Per cent change	1924	1929	Per cent change	1924	1929	Per cent change
9 large union plants	All	286	317	+10.8	49	27	-44.9	21	50	+138.1	18	29	+61.1	142	140	-1.4	37[a]	56[a]	+51.3	19	15	-21.1
	Hand	100	66	-34.0	40	22	-45.0	-	-	-	13	7	-46.2	43	34	-20.9	4	3	-25.0	-	-	-
	Machine	186	251	+34.9	9	5	-44.4	21	50	+138.1	5	22	+340.0	99	106	+7.1	33	53	+60.6	19	15	-21.1
36 medium-size union plants	All	358	419	+17.0	145	121	-16.6	57	114	+100.0	44	66	+50.0	108	109	+0.9	4	9	+125.0	-	-	-
	Hand	209	183	-13.9	101	95	-5.8	-	-	-	32	25	-21.9	74	60	-18.9	2	3	+50.0	-	-	-
	Machine	149	236	+60.4	44	26	-40.9	57	114	+100.0	12	41	+241.7	34	49	+44.1	2	6	+200.0	-	-	-
8 medium-size non-union plants	All	50	66	+32.0	26	20	-23.1	13	26	+100.0	4	10	+150.0	7	10	+42.9	-	-	-	-	-	-
	Hand	24	22	-8.3	16	13	-18.7	-	-	-	4	4	0.0	4	5	+25.0	-	-	-	-	-	-
	Machine	26	44	+69.2	10	7	-30.0	13	26	+100.0	0	6	-	3	5	+66.7	-	-	-	-	-	-

TABLE 6 - Continued

MEN EMPLOYED	TOTAL			PLATENS			JOB AUTOMATICS AND SMALL CYLINDERS COMBINED[b]			LARGE CYLINDERS			TWO-COLOR AND PERFECTING			ROTARIES		
	1924	1929	Per cent change	1924	1929	Per cent change	1924	1929	Per cent change	1924	1929	Per cent change	1924	1929	Per cent change	1924	1929	Per cent change
9 large union plants,																		
Pressmen	184	219	+19.0	16	10	-37.5	21	47	+123.8	76	79	+3.9	35	53	+51.4	36	30	-16.7
Assistants	241	259	+7.4	24	16	-33.3	23	40	+73.9	142	141	-0.7	37	56	+52.7	15	6	-60.0
Hand-feeders	81	60	-25.9	22	15	-31.8	12	7	-41.7	43	35	-18.6	4	3	-25.0	-	-	-
Operators	160	199	+20.4	2	1	-50.0	11	33	+200.0	99	106	+7.7	33	53	+60.6	15	6	-60.0
36 medium-size union plants,																		
Pressmen	144	188	+30.6	38	31	-18.4	43	86	+100.0	60	64	+6.7	3	7	+133.3	-	-	-
Assistants	211	234	+10.9	59	53	-10.2	43	64	+48.7	106	110	+3.9	3	7	+133.3	-	-	-
Hand-feeders	151	129	-14.6	58	51	-12.1	20	18	-10.0	72	59	-18.1	1	1	0.0	-	-	-
Operators	60	105	+75.0	1	2	+100.0	23	46	+100.0	34	51	+50.0	2	6	+200.0	-	-	-
8 Small non-union plants,																		
Pressmen	18	27	+50.0	7	6	-14.3	7	15	+114.3	4	6	+50.0	-	-	-	-	-	-
Assistants	25	31	+24.0	9	11	+22.2	8	11	+37.5	8	9	+12.5	-	-	-	-	-	-
Hand-feeders	15	17	+13.3	8	8	0.0	2	3	+50.0	5	6	+20.0	-	-	-	-	-	-
Operators	10	14	+40.0	1	3	+200.0	6	8	+33.3	3	3	0.0	-	-	-	-	-	-

[a] Includes three perfectors in 1924 and five in 1929.

[b] Interwork by the men in these two groups is so common that they cannot be listed separately with accuracy.

TABLE 7.- SUMMARY OF PRESS EQUIPMENT AND MEN IN 9 LARGE AND 36 MEDIUM-SIZE UNION PLANTS AND 8 NON-UNION PLANTS IN NEW YORK CITY IN 1924 AND IN 1929, SHOWING INCREASES IN THE USE OF NEW TECHNIQUES AND CHANGES IN THE EMPLOYMENT OF PRESSMEN AND ASSISTANTS

Winter of 1923-1924 and winter of 1928-1929.
Derived from appendix tables 6 and 8.

PRESSES AND MEN	9 PLANTS			36 PLANTS			8 PLANTS		
	1924	1929	Per cent change	1924	1929	Per cent change	1924	1929	Per Cent change
Presses	286	317	+10.8	358	419	+17.0	50	66	+32.0
Hand-fed	100	66	-34.0	209	183	-13.9	24	22	-8.3
Machine-fed	186	251	+34.9	149	236	+60.4	26	44	+69.2
Old models	191	167	-12.6	253	230	-9.1	33	30	-9.1
New models	95	150	+57.9	105	189	+80.0	17	36	+111.8
Percentage hand-fed of total	35.0	20.8	-40.6	58.3	43.6	-25.2	48.0	33.3	-30.6
" old models of total	66.8	52.7	-21.1	70.7	54.9	-22.3	66.0	45.5	-31.1
Men Employed	425	478	+12.5	355	422	+18.9	43	58	+34.9
Pressmen									
Number of pressmen	184	219	+19.0	144	188	+30.6	18	27	+50.0
Percentage of total men on									
All presses	43.3	45.8	+5.8	40.6	44.5	+9.6	41.9	46.6	+11.2
Old models	35.7	36.2	+1.4	37.3	36.8	-1.3	39.3	37.5	-4.6
New models	55.1	56.0	+1.6	50.0	56.7	+13.4	46.7	57.7	+23.6
Assistants									
Number of assistants	241	259	+7.4	211	234	+10.9	25	31	+24.0
Hand-feeders	81	60	-25.9	151	129	-14.6	15	17	+13.3
Operators	160	199	+20.4	60	105	+75.0	10	14	+40.0
Percentage of total men on									
All presses	56.7	54.2	-4.4	59.4	55.4	- 6.7	58.1	53.4	-8.1
Old models	64.3	63.8	-0.8	62.7	63.2	+ 0.8	60.7	62.5	+3.0
New models	44.9	44.0	-2.0	50.0	43.3	-13.4	53.3	42.3	-20.6
Percentage hand-feeders of total assistants	33.6	23.2	-31.0	71.5	55.1	-22.9	60.0	54.8	- 8.7

TABLE 8.- NUMBER OF MEN EMPLOYED PER 100 NEW-MODEL PRESSES AS COMPARED WITH THOSE EMPLOYED PER 100 OLD-MODEL PRESSES, IN 53 NEW YORK CITY PLANTS AND IN THEIR COMPONENT GROUPS, TOGETHER WITH PERCENTAGES OF CHANGE OVER THE FIVE-YEAR PERIOD 1924-29 .

Derived from table 9.
Winter of 1923-1924 and winter of 1928-1929.

NUMBER OF MEN TO 100 PRESSES Actually[a] employed									PRESS GROUP	NUMBER OF MEN TO 100 PRESSES Theoretically[a] employed								
Pressmen			Assistants			Total				Pressmen			Assistants			Total		
1924	1929	Per cent change	1924	1929	Per cent change	1924	1929	Per cent change		1924	1929	Per cent change	1924	1929	Per cent change	1924	1929	Per cent change
									53 Plants									
42.1	45.9	+9.0	73.0	79.6	+9.0	115.1	125.5	+9.0	Old models	41.5	42.6	+2.6	79.2	84.3	+6.4	120.9	126.9	+4.9
66.8	63.5	-4.9	59.4	49.1	-17.3	126.3	112.5	-10.9	New models[b]	71.9	67.7	-5.8	69.1	53.6	-22.4	141.0	122.9	-12.8
49.9	54.1	+8.4	68.7	65.3	-4.9	118.6	119.5	+ 0.7	All presses	51.0	54.3	+6.5	76.2	69.9	-8.3	127.2	125.1	-1.6
									9 Large union plants									
48.2	53.3	+10.6	86.9	94.0	+8.1	135.1	147.3	+9.0	Old models	44.5	44.6	0.0	90.0	94.0	+4.4	134.6	140.7	+4.5
96.8	86.7	-10.4	79.0	68.0	-13.9	175.8	154.7	-12.0	New models	96.8	81.3	-16.0	80.0	68.0	-15.0	178.9	153.3	-14.3
64.3	69.1	+7.5	84.3	81.7	-3.1	148.6	150.8	+1.5	All presses	61.8	63.0	+1.9	86.7	81.7	-5.5	147.8	146.7	-0.7
									36 Medium-size union plants									
38.7	41.3	+6.7	65.2	70.9	+8.7	104.0	112.2	+7.9	Old models	39.9	40.0	+0.3	72.7	78.7	+8.3	112.2	118.7	+5.8
43.8	49.2	+12.3	43.8	37.6	-14.1	87.6	86.8	-0.9	New models[b]	53.3	59.2	+11.1	60.9	42.8	-29.7	114.3	102.1	-10.7
40.2	44.9	+11.7	59.0	55.8	-5.4	99.2	100.7	+1.5	All presses	43.8	48.7	+11.2	69.3	62.5	-9.8	113.1	111.2	-0.8
									8 Medium-size non-union plants									
33.3	40.0	+20.1	51.5	66.7	+29.5	84.8	106.7	+25.8	Old models	36.3	40.0	+10.1	69.3	73.3	+5.7	106.1	113.3	+6.8
41.2	41.7	+1.5	47.1	30.6	-35.0	88.2	72.2	-18.1	New models[b]	47.0	55.5	+18.1	58.8	50.0	-14.9	105.8	105.5	-0.3
36.0	40.9	+13.8	50.0	47.0	-6.0	86.0	87.9	+2.2	All presses	40.0	48.4	+21.0	66.0	60.6	-8.2	106.6	109.0	+2.2

[a] Refer to explanatory footnotes a and b under appendix table 9.

[b] See footnote a to appendix table 13 for explanation of the classification of all small cylinders among the new models.

TABLE 9.- PRESS EQUIPMENT IN 53 NEW YORK CITY PLANTS AND IN THEIR COMPONENT GROUPS AND ASSISTANTS (1) WHO WERE ACTUALLY[a] EMPLOYED AND (2) WHO WOULD HAVE RUNNING AT CAPACITY. Winter of 1923-1924 and winter of 1928-1929.

MEN ACTUALLY[a] EMPLOYED						PRESS GROUP
Pressmen		Assistants		Total		
1924	1929	1924	1929	1924	1929	
						53 Plants
201	196	348	340	549	536	Old models
61	47	92	80	153	127	Platens
140	149	256	260	396	409	Large cylinders
145	238	129	184	274	422	New models
71	148	74	115	145	263	Job-automatics Small cylinders[c]
38	60	40	63	78	123	2-color and perfectors
36	30	15	6	51	36	Rotaries
346	434	477	524	823	958	Total
						9 Large Union Plants
92	89	166	157	258	246	Old models
16	10	24	16	40	26	Platens
76	79	142	141	218	220	Large cylinders
92	130	75	102	167	232	New models
21	47	23	40	44	87	Job-automatics Small cylinders
35	53	37	56	72	109	2-color and perfectors
36	30	15	6	51	36	Rotaries
184	219	241	259	425	478	Total
						36 Medium-Size Union Plants
98	95	165	163	263	258	Old models
38	31	59	53	97	84	Platens
60	64	106	110	166	174	Large Cylinders
46	93	46	71	92	164	New models
43	86	43	64	86	150	Job-automatics Small cylinders
3	7	3	7	6	14	2-color and perfectors
144	188	211	234	355	422	Total
						8 Medium-Size Non-Union Plants
11	12	17	20	28	32	Old models
7	6	9	11	16	17	Platens
4	6	8	9	12	15	Large cylinders
7	15	8	11	15	26	New models
7	15	8	11	15	26	Job-automatics Small cylinders
18	27	25	31	43	58	Total

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[a] "Men actually employed" is to be interpreted as meaning those regularly or customarily employed. Men temporarily employed on presses which as a rule may have been idle were not included.

IN 1924 AND 1929, BY OLD AND NEW MODELS, SHOWING NUMBER OF PRESSMEN
BEEN EMPLOYED ACCORDING TO COLLECTIVE AGREEMENT HAD ALL PRESSES BEEN

Winter of 1923-1924 and winter of 1928-1929.

PRESSES		MEN THEORETICALLY EMPLOYED[b]					
		Pressmen		Assistants		Total	
1924	1929	1924	1929	1924	1929	1924	1929
------ 477	------ 427	------ 198	------ 182	------ 379	------ 360	------ 577	------ 542
220	168	70	51	122	101	192	152
257	259	128	131	257	259	385	390
------ 217	------ 375	------ 156	------ 254	------ 150	------ 201	------ 306	------ 461
91	190	45	107	32	65	77	172
66	105	34	58	62	65	96	123
41	65	41	65	41	65	82	130
19	15	36	24	15	6	51	36
------ 694	------ 802	------ 354	------ 436	------ 529	------ 561	------ 883	------ 1003
------ 191	------ 167	------ 85	------ 78	------ 172	------ 157	------ 257	------ 235
49	27	14	7	30	17	44	24
142	140	71	71	142	140	213	211
------ 95	------ 150	------ 92	------ 122	------ 76	------ 102	------ 168	------ 230
21	50	10	27	9	23	19	50
18	29	9	15	15	17	24	32
37	56	37	56	37	56	74	112
19	15	36	24	15	6	51	36
------ 286	------ 317	------ 177	------ 200	------ 248	------ 259	------ 425	------ 465
------ 253	------ 230	------ 101	------ 92	------ 184	------ 181	------ 285	------ 273
145	121	47	37	76	72	123	109
108	109	54	55	108	109	162	164
------ 105	------ 189	------ 56	------ 112	------ 64	------ 81	------ 120	------ 193
57	114	29	66	17	30	46	96
44	66	23	37	43	42	66	79
4	9	4	9	4	9	8	18
------ 358	------ 419	------ 157	------ 204	------ 248	------ 262	------ 405	------ 466
------ 33	------ 30	------ 12	------ 12	------ 23	------ 22	------ 35	------ 34
26	20	9	7	16	12	25	19
7	10	3	5	7	10	10	15
------ 17	------ 36	------ 8	------ 20	------ 10	------ 18	------ 18	------ 38
13	26	6	14	6	12	12	26
4	10	2	6	4	6	6	12
------ 50	------ 66	------ 20	------ 32	------ 33	------ 40	------ 53	------ 72

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[b] "Men theoretically employed" are those who would have been employed according to collective agreement had all presses been running at capacity.

[c] Footnote [a] to appendix table 12 explains the reason for classifying all small cylinders among the new models.

TABLE 10. - MAN-HOUR PRODUCTION AND UNIT WAGE-COST OF PRINTING, BY GIVEN PRESS GROUPS, AND BY METHOD OF FEEDING, 1924 AND 1929
36 MEDIUM-SIZE UNION PRESSROOMS IN NEW YORK CITY[a]

PRESS GROUP	PRESS EQUIPMENT[a]		COMPLEMENT OF MEN[a]			WAGE-COST[a] PER HOUR FOR PRESS GROUP	AVERAGE MAN-HOUR WAGE	SQUARE INCHES OF PRINTING IN THOUSANDS[b]		WAGE-COST[a] PER MILLION SQUARE INCHES OF PRINTING
	Method of Feeding	Presses	Press-men	Assist-ants	Total			Capacity per Hour for Press Group	Average Man-Hour Production	
1 9 2 4										
Platens	Hand	101	25	76	101	$ 75.66	$ 0.75	17,429	173	$ 4.340
	Machine	44	22	-	22	23.54	1.07	9,346	425	2.518
Total for group		145	47	76	123	99.20	0.81	26,768	218	3.706
Job-Automatics	Machine	57	29	17	46	42.83	0.93	42,669	928	1.004
Small Cylinders										
Over 22", incl. 29"	Machine	1	1	-	1	1.09	1.09	798	798	1.363
" 29", " 42"	Hand	32	16	32	48	49.28	1.03	30,853	643	1.597
" " , " "	Machine	11	6	11	17	17.51	1.03	14,327	843	0.875
Total	Hand	32	16	32	48	49.28	1.03	30,853	643	1.597
"	Machine	12	7	11	18	18.60	1.03	15,125	840	1.230
Total for group		44	23	43	66	67.88	1.03	45,977	697	1.476
Large Cylinders										
Over 42", incl. 68"	Hand	74	37	74	111	113.96	1.03	129,408	1,166	0.881
" " , " "	Machine	34	17	34	51	52.36	1.03	75,704	1,484	0.692
Total for group		108	54	108	162	166.32	1.03	205,111	1,266	0.811
Two-Color and Perfecting Cylinders	Hand	2	2	2	4	4.42	1.11	8,736	2,184	0.506
	Machine	2	2	2	4	4.42	1.11	8,868	2,217	0.498
Total for group		4	4	4	8	8.84	1.11	17,604	2,200	0.502
All Groups	Hand	209	80	184	264	243.32	0.92	186,426	706	1.305
	Machine	149	77	64	141	141.75	1.01	151,710	1,076	0.934
Total for all groups		358	157	248	405	385.07	0.95	338,136	835	1.138

Table 10 - Continued

1 9 2 9										
Platens	Hand	95	24	72	96	$ 79.20	$ 0.83	16,405	171	$ 4.829
	Machine	26	13	-	13	15.08	1.16	5,387	414	2.797
Total for group		121	37	72	109	94.28	0.86	21,791	200	4.327
Job-Automatics		114	66	30	96	105.72	1.10	78,866	822	1.339
Small Cylinders										
Over 22", incl.29"	Machine	6	4	4	8	8.56	1.07	7,951	994	1.077
" 29", " 42"	Hand	25	13	25	38	42.26	1.11	24,992	658	1.691
" " , " "	Machine	35	20	13	33	41.07	1.24	43,329	1,313	0.948
Total	Hand	25	13	25	38	42.26	1.11	24,992	658	1.691
"	Machine	41	24	17	41	49.63	1.21	51,280	1,251	0.968
Total for group		66	37	42	79	91.89	1.16	76,272	965	1.206
Large Cylinders										
Over 42", incl. 68"	Hand	60	30	60	90	99.90	1.11	105,075	1,167	0.951
" " , " "	Machine	49	25	49	74	82.22	1.11	111,589	1,508	0.731
Total for group		109	55	109	164	182.12	1.11	216,664	1,321	0.841
Two-Color and Perfecting Cylinders	Hand	3	3	3	6	7.32	1.22	13,053	2,175	0.561
	Machine	6	6	6	12	14.64	1.22	29,382	2,449	0.498
Total for group		9	9	9	18	21.96	1.22	42,435	2,358	0.517
All Groups	Hand	183	70	160	230	228.68	0.99	159,524	694	1.434
	Machine	236	134	102	236	267.29	1.13	276,504	1,172	0.967
Total for all groups		419	204	262	466	495.97	1.06	436,028	936	1.137

[a] Press equipment is that actually present on the floors of these shops in the two given periods. The complements of men in this table are not necessarily identical with those actually employed, but with those who would have been employed according to collective agreement had all presses been running at capacity. Wage costs per running hour were computed for this full equipment and capacity production. Standard Complement of Men and Respective Wage Scales in Union Shops are shown in appendix exhibit 12.

[b] Explanation of the process of computing square-inch capacity is included in appendix research note 2 on Measuring the Productivity of Presses.

TABLE 11. - MAN-HOUR PRODUCTION AND UNIT WAGE-COST OF PRINTING, BY GIVEN PRESS GROUPS, BY METHOD OF FEEDING, 1924 AND 1929
NINE LARGE UNION PRESSROOMS IN NEW YORK CITY[a]

PRESS GROUP	PRESS EQUIPMENT		COMPLEMENT OF MEN			WAGE-COST PER HOUR FOR PRESS GROUP	AVERAGE MAN-HOUR WAGE	SQUARE INCHES OF PRINTING IN THOUSANDS		WAGE-COST PER MILLION SQUARE INCHES OF PRINTING
	Method of Feeding	Presses	Press-men	Assist-ants	Total			Capacity per Hour for Press Group	Average Man-Hour Production	
1 9 2 4										
Platens	Hand	40	10	30	40	$ 30.00	$0.75	8,168	204	$3.672
	Machine	9	4	-	4	4.28	1.07	1,842	460	2.326
Total for group		49	14	30	44	34.28	0.78	10,010	227	3.425
Job-automatics	Machine	21	10	9	19	16.84	0.83	15,577	920	1.081
Small cylinders										
Over 29", incl. 42"	Hand	13	6	13	19	19.45	1.02	11,468	604	1.696
" " , " "	Machine	5	3	2	5	5.36	1.07	6,401	1,280	0.837
Total for group		18	9	15	24	24.81	1.03	17,869	745	1.389
Large cylinders										
Over 42", incl. 68"	Hand	43	21	43	64	65.65	1.03	80,048	1,251	0.820
" " , " "	Machine	99	50	99	149	153.03	1.03	228,581	1,534	0.669
Total for group		142	71	142	213	218.68	1.03	308,629	1,449	0.709
Two-Color and per-)	Hand	4	4	4	8	8.84	1.11	13,608	1,701	0.650
fecting cylinders)	Machine	33	33	33	66	72.93	1.11	157,188	2,382	0.470
Total for group		37	37	37	74	81.77	1.11	170,796	2,308	0.479
Rotaries[b]	Machine	19	36	15	51	60.68	1.19	299,105	5,865	0.203
All groups	Hand	100	41	90	131	123.94	0.95	113,293	865	1.094
	Machine	186	136	158	294	313.12	1.06	708,693	2,411	0.442
Total for all groups		286	177	248	425	437.06	1.03	821,986	1,934	0.532

1 9 2 9										
Platens	Hand	22	5	17	22	$ 17.96	$0.82	4,349	198	$4.129
	Machine	5	2	-	2	2.32	1.16	1,012	506	2.297
Total for group		27	7	17	24	20.28	0.85	5,361	223	3.784
Job-automatics	Machine	50	27	23	50	51.08	1.02	32,231	645	1.584
Small cylinders										
Over 22",incl. 29"	Machine	6	3	3	6	6.42	1.07	6,355	1,059	1.009
" 29", " 42"	Hand	7	3	7	10	11.02	1.10	6,000	600	1.837
" ", " "	Machine	16	9	7	16	19.62	1.23	20,237	1,265	0.969
Total	Hand	7	3	7	10	11.02	1.10	6,000	600	1.837
"	Machine	22	12	10	22	26.04	1.18	26,593	1,209	0.979
Total for group		29	15	17	32	37.06	1.16	32,593	1,019	1.137
Large cylinders										
Over 42",incl. 68"	Hand	33	16	33	49	54.31	1.11	62,646	1,278	0.867
" ", " "	Machine	104	52	104	156	173.16	1.11	240,226	1,540	0.721
" 68"	Hand	1	1	1	2	2.30	1.15	2,540	1,270	0.906
" "	Machine	2	2	2	4	4.60	1.15	5,657	1,414	0.812
Total	Hand	34	17	34	51	56.61	1.11	65,186	1,278	0.868
"	Machine	106	54	106	160	177.76	1.11	245,883	1,537	0.723
Total for group		140	71	140	211	234.37	1.11	311,069	1,474	0.753
Two-Color and per-)	Hand	3	3	3	6	7.32	1.22	10,480	1,747	0.700
fecting cylinders)	Machine	53	53	53	106	129.32	1.22	252,865	2,386	0.511
Total for group		56	56	56	112	136.64	1.22	263,345	2,351	0.519
Rotaries[b]	Machine	15	30	6	36	47.11	1.22	241,025	6,695	0.195
All groups	Hand	66	28	61	89	92.91	1.04	86,016	966	1.080
	Machine	251	178	198	376	433.63	1.15	799,608	2,127	0.542
Total for all groups		317	206	259	465	526.54	1.13	885,624	1,905	0.595

[a] Explanations of this table are made in footnotes a and b of appendix table 10.

[b] The rotaries in 1923-24 consisted of 5 web presses without offset-rolls and 3 with offset-rolls, 5 sheet-fed rotaries, 1 offset press, 2 U.P.M. and 3 McKee presses. In 1928-29 the rotaries consisted of 9 web presses without offset-rolls, 5 sheet-fed rotaries and 1 two-color press.

TABLE 12.- RELATIVE PRODUCTIVITY, MEN EMPLOYED, MAN-HOUR PRODUCTION, AND UNIT WAGE-COST ON MACHINE-FED AND HAND-FED PRESSES AND ON OLD AND NEW-MODEL PRESSES, 1924 AND 1929. 9 LARGE AND 36 MEDIUM-SIZE UNION PLANTS IN NEW YORK CITY, SEPARATELY AND COMBINED[a]

These are based upon standard calculations as explained in Table 13.

PRESSES AND METHOD OF FEEDING		PRINTING CAPACITY			STANDARD COMPLEMENT OF MEN			AVERAGE MAN-HOUR PRINTING PRODUCTION			UNIT WAGE-COST		
		Ratio MF to HF		Per cent change	Ratio MF to HF		Per cent change	Ratio MF to HF		Per cent change	Ratio MF to HF		Per cent change
		1924	1929		1924	1929		1924	1929		1924	1929	
9 LARGE PLANTS													
Platens		0.225	0.223	-46.4	0.100	0.091	-45.4	2.254	2.559	-1.8	0.633	0.556	+10.5
	Hand			-46.8			-45.0			-3.2			+12.4
	Machine			-45.1			-50.0			+9.9			-1.2
Job-automatics	Machine			+106.9			+163.2			-29.9			+46.5
Small cylinders		0.558	4.099	+82.4	0.263	2.200	+33.3	2.121	2.044	+36.8	0.494	0.533	-18.1
	Hand			-47.7			-47.4			-0.6			+8.3
	Machine			+315.4			+340.0			-5.6			+17.0
Large cylinders		2.856	3.772	+0.8	2.328	3.137	-0.9	1.226	1.202	+1.7	0.816	0.833	+6.2
	Hand			-18.6			-20.3			+2.2			+5.9
	Machine			+7.5			+7.4			+0.1			+8.1
2-color & perfecting presses		11.551	24.128	+54.2	8.250	17.667	+51.4	1.400	1.366	+1.9	0.723	0.730	+8.4
	Hand			-29.8			-25.0			+2.6			+7.7
	Machine			+60.9			+60.6			+0.2			+8.7
Rotaries	Machine			-19.4			-29.4			+14.2			-3.9
36 MEDIUM-SIZE PLANTS													
Platens		0.536	0.328	-18.6	0.218	0.135	-11.4	2.462	2.425	-8.2	0.580	0.579	+16.8
	Hand			-5.9			-5.0			-1.0			+11.3
	Machine			-42.3			-40.9			-2.5			+11.1
Job-automatics	Machine			+84.8			+108.7			-11.4			+33.4
Small cylinders		0.490	2.052	+69.6	0.375	1.078	+19.7	1.307	1.902	+38.6	0.770	0.572	-18.3
	Hand			-19.0			-20.8			+2.3			+5.9
	Machine			+239.0			+127.8			+48.8			-21.3
Large cylinders		0.585	1.062	+5.6	0.459	0.822	+1.2	1.273	1.292	+4.3	0.786	0.769	+3.7
	Hand			-18.8			-18.9			+0.1			+7.9
	Machine			+47.4			+45.1			+1.6			+5.6
2-color & perfecting presses		1.015	2.251	+141.1	1.000	2.000	+125.0	1.011	1.126	+7.1	0.984	0.888	+3.0
	Hand			+49.4			+50.0			-0.4			+10.9
	Machine			+231.3			+200.0			+10.4			0.0

TABLE 12 - Continued

PRESSES AND METHOD OF FEEDING	PRINTING CAPACITY			STANDARD COMPLEMENT OF MEN			AVERAGE MAN-HOUR PRINTING PRODUCTION			UNIT WAGE-COST		
	Ratio MF to HF		Per cent change	Ratio MF to HF		Per cent change	Ratio MF to HF		Per cent change	Ratio MF to HF		Per cent change
	1924	1929		1924	1929		1924	1929		1924	1929	
9 LARGE PLANTS												
All presses	6.255	9.296	+7.7	2.244	4.224	+9.4	2.787	2.200	-1.5	0.404	0.502	+11.8
Hand			-24.1			-32.1			+11.7			-1.3
Machine			+12.8			+27.9			-11.8			+22.6
36 MEDIUM-SIZE PLANTS												
All presses	0.814	1.733	+29.0	0.534	1.026	+15.1	1.524	1.689	+12.1	0.716	0.674	-0.1
Hand			-14.4			-12.9			-1.8			+9.9
Machine			+82.3			+67.4			+8.9			+3.5
45 PLANTS (9 AND 36)												
All presses	2.871	4.383	+13.9	1.101	1.918	+12.2	2.607	2.284	+1.5	0.432	0.497	+9.2
Hand			-18.1			-19.2			+1.4			+6.9
Machine			+25.1			+40.7			-11.1			+23.1
	Ratio new models to old models			Ratio new models to old models			Ratio new models to old models			Ratio new models to old models		
9 LARGE PLANTS												
All presses	1.490	1.747	+7.7	0.540	0.898	+9.4	2.760	1.945	-1.5	0.405	0.562	+11.8
Old models			-2.3			-11.2			+10.0			-0.1
New models			+ 14.5			+47.7			-22.5			+38.6
36 MEDIUM-SIZE PLANTS												
All presses	0.287	0 .655	+29.0	0.216	0.498	+15.1	1.327	1.314	+12.1	0.779	0.849	-0.1
Old models			+0.3			-6.6			+7.4			+1.0
New models			+128.9			+115.3			+6.3			+10.1
45 PLANTS												
All presses	0.957	1.256	+13.9	0.363	0.674	+12.2	2.637	1.862	+1.5	0.418	0.597	+9.2
Old models			-1.2			-8.7			+8.2			+0.7
New models			+29.7			+69.7			-23.6			+44.0

[a] This table is derived from the figures presented in appendix tables 10, 11 and 13.

TABLE 13.- MAN-HOUR PRODUCTION AND UNIT WAGE-COST OF PRINTING IN TWO GROUPS OF NEW YORK CITY UNION PLANTS, SEPARATELY AND COMBINED, 1924 AND 1929, BY HAND- AND MACHINE-FED PRESSES[a], AND BY OLD- AND NEW-MODEL PRESSES

These are all standard calculations. The complements of men are not necessarily those actually employed but are those who would have been employed according to collective agreement had all presses been running at capacity. Wage-costs per running hour are computed for full equipment and capacity production.[c]

PLANT GROUP	PRESSES	STANDARD HOURLY SQUARE-INCH PRINTING CAPACITY[b] (000)		STANDARD COMPLEMENT OF MEN[c]		AVERAGE MAN-HOUR PRINTING PRODUCTION (000 SQ.IN.)		WAGE-COST[c] PER MILLION SQ. IN. OF PRINTING	
		1924	1929	1924	1929	1924	1929	1924	1929
45 plants	Hand-fed	299,719	245,540	395	319	759	770	$1.225	$1.310
	Machine-fed	860,404	1,076,112	435	612	1,978	1,758	.529	.651
45 plants	Old models	592,846	585,877	609	556	973	1,054	.990	.997
	New "	567,276	735,774	221	375	2,567	1,962	.414	.596
9 large plants	Old models	330,107	322,430	276	245	1,196	1,316	.825	.824
	New "	491,879	563,193	149	220	3,301	2,560	.334	.463
36 medium-size plants	Old models	262,739	263,447	333	311	789	847	1.198	1.210
	New "	75,397	172,581	72	155	1,047	1,113	.933	1.027

[a] Derived from appendix tables 10 and 11 where productivity was computed according to the method of press-feeding. There the divisions of presses were made regardless of whether they were obsolescent or labor-saving (old or new models). Here, where productivity is computed according to whether the presses are old or new models, the method of feeding is disregarded except for the small cylinders, among which old models are hand-fed and new models are machine-fed. This distinction could not be made in tables 8 and 9, however, because of the comparisons to be made of men "theoretically employed" (according to the standard complement) with those actually employed, inasmuch as shop practice requires men to interwork among the small cylinders and the job-automatics. As a matter of fact, the difference in the resulting figures was found not to be important because of the few small cylinders which were hand-fed.

[b] This computation is explained in appendix research note 2 on Measuring the Productivity of Presses.

[c] The Standard Complement of Men and Respective Wage Scales in Union Shops is shown in appendix exhibit 12.

TABLE 14.- PRESS EQUIPMENT AND SQUARE-INCH PRINTING CAPACITY PER HOUR IN 8 MEDIUM-SIZE NON-UNION PLANTS IN NEW YORK CITY AND IN 2[a] LARGE UNION AND NON-UNION PLANTS IN AND NEAR CHICAGO, BY PRESS GROUPS AND METHOD OF FEEDING AND BY OLD AND NEW MODELS, 1924 AND 1929
Winter of 1923-1924 and winter of 1928-1929.

PRESS GROUP		PRESSES		PRINTING CAPACITY PER HOUR 000 SQ.IN.		
		1924	1929	1924	1929	Per cent change
8 New York City Plants						
Platens		26	20	7,169	3,255	-54.6
	Hand	16	13	5,370	2,090	-61.1
	Machine	10	7	1,799	1,165	-35.2
Job-automatics	Machine	13	26	9,715	17,728	+82.5
Small cylinders		4	10	3,477	10,402	0.0
	Hand	4	4	3,477	3,477	0.0
	Machine	-	6	-	6,925	-
Large cylinders		7	10	13,720	19,481	+42.0
	Hand	4	5	6,571	8,060	+22.6
	Machine	3	5	7,149	11,421	+59.8
All groups		50	66	34,081	50,866	+49.3
	Hand	24	22	15,419	13,626	-11.6
	Machine	26	44	18,662	37,240	+99.5
	Old models	37	34	24,366	26,213	+7.6
	New models	13	32	9,715	24,653	+153.8
2 Plants in and Near Chicago[a]						
Platens		22	10	3,805	1,954	-48.6
	Hand	17	6	2,875	1,200	-58.3
	Machine	5	4	930	754	-18.9
Job-automatics	Machine	6	10	3,918	6,121	+56.2
Small cylinders		7	5	7,443	7,027	-5.6
	Hand	6	1	6,110	1,119	-81.7
	Machine	1	4	1,333	5,908	+333.2
Large cylinders		52	53	124,515	134,594	+8.2
	Hand	6	8	10,222	10,983	+7.4
	Machine	46	45	114,293	123,611	+8.2
Two-color and perfecting presses	Machine	31	38	175,437	209,927	+19.7
Rotaries	Machine	79	128	2,243,664	3,709,728	+65.3
All groups		197	244	2,558,782	4,069,351	+59.0
	Hand	29	15	19,207	13,302	-30.7
	Machine	168	229	2,539,575	4,056,049	+59.7
	Old models	80	64	134,430	137,667	+2.4
	New models	117	180	2,424,352	3,931,684	+62.2

[a] For the third of the plants in and near Chicago which was included in this study, the presses could not be given by exact sizes although they were listed by groups and by method of feeding. Consequently, the total printing capacity of this plant was estimated, with the belief that the estimate is reliable. In 1924 the equipment consisted of 4 hand-fed platens, 6 small cylinders, 12 large cylinders, 4 machine-fed 2-color and perfecting presses and 17 rotaries. The estimated printing capacity was 425,000,000 square inches. In 1929 there were 2 hand-fed platens, 4 job automatics, 1 hand-fed and 4 machine-fed small cylinders, no large cylinders, 4 machine-fed 2-color and perfecting presses and 32 rotaries, the estimated capacity of which was 770,000,000 square inches.

TABLE 15.- WAGE EARNERS, WAGES AND DOLLAR-PRODUCTION OF BOOK AND JOB PRINTING IN NEW YORK CITY, CHICAGO AND THE UNITED STATES, 1914-1929[a]

AREA		WAGE EARNERS	WAGES[b]	VALUE ADDED BY MANUFACTURE[b]	WAGE-COST PER DOLLAR OF VALUE ADDED BY MANUFACTURE	AVERAGE WAGE PER MAN	VALUE ADDED PER MAN
1914	New York City	21,013	$ 16,278,588	$ 51,802,517	$ .314	$ 775	$ 2,465
	Chicago	16,966	13,204,321	33,342,934	.396	778	1,965
	Rest of U.S.	75,142	50,449,507	129,816,454	.389	671	1,728
	Total	113,121	79,932,416	214,961,905	.372	707	1,900
1919	New York City	21,097	14,158,132	44,053,750	.321	671	2,088
	Chicago	19,936	12,361,337	31,331,780	.395	620	1,572
	Rest of U. S.	81,972	42,025,222	111,918,760	.376	513	1,365
	Total	123,005	68,544,691	187,304,290	.366	557	1,523
1921	New York City	21,358	26,085,203	71,336,786	.366	1,221	3,340
	Chicago	19,278	20,673,418	59,089,637	.350	1,072	3,065
	Rest of U. S.	80,419	76,499,086	192,198,769	.398	951	2,390
	Total	121,055	123,257,707	322,625,192	.382	1,018	2,665
1925	New York City	20,622	26,124,710	77,212,360	.338	1,267	3,744
	Chicago	22,342	26,393,760	68,619,642	.385	1,181	3,071
	Rest of U. S.	90,352	86,000,967	218,501,680	.393	952	2,418
	Total	133,316	138,519,437	364,333,682	.380	1,039	2,733
1927	New York City	24,238	34,227,135	108,219,048	.316	1,412	4,465
	Chicago	23,272	30,030,244	80,540,200	.373	1,290	3,461
	Rest of U. S.	93,768	99,497,982	258,094,715	.386	1,061	2,752
	Total	141,278	163,755,361	446,853,963	.366	1,159	3,163
1929	New York City	25,431	35,858,575	127,658,806	.281	1,410	5,020
	Chicago	24,043	29,286,956	85,305,153	.343	1,218	3,548
	Rest of U. S.	101,175	107,522,068	294,865,418	.365	1,063	2,914
	Total	150,649	172,667,599	507,829,377	.340	1,146	3,371

[a] U.S. Census of Manufactures. The corresponding figures for 1915, 1917 and 1923 were not fully reported; those for 1929 were sent to the writer by the Census Bureau in advance of publication. It should also be mentioned that the 1929 reports for book and job printing include the manufacture of paper patterns. As it was impossible to secure the reports for these establishments by cities, they could not be deducted from the reports for commercial printing. However, the number of establishments and the value of their paper-pattern production are relatively so small that they do not seriously affect the total figures for the present purposes.

[b] Corrected for changes in the value of the dollar.

TABLE 16.- NIGHT-SHIFT LABOR-WEEKS[a] WORKED BY PRESSMEN AND ASSISTANTS IN 5 LARGE NEW YORK CITY PRESSROOMS DURING FOUR WEEKS OF MARCH 1924 AND MARCH 1929[b]

LABOR GROUP AND TIME PERIOD	1924		1929		PER CENT CHANGE 1924-29
	Labor-weeks	Per cent of total	Labor-weeks	Per cent of total	
Pressmen and assistants					
Total weeks[a]	313		465		+48.6
Pressmen					
Total weeks	122	100.0	196	100.0	+60.6
40-hour weeks (full time)	9	7.4	36	18.4	+300.0
Weeks less than 40 hours	48	39.3	66	33.7	+37.5
" more " 40 "	65	53.3	94	47.9	+44.6
Total weeks 40 hours and over	74	60.7	130	66.3	+75.7
Weeks 24 hours and less	31	25.4	44	22.4	+41.9
" 48 " " over	27	22.1	28	14.3	+3.7
Assistants					
Total weeks	191	100.0	269	100.0	+40.8
40-hour weeks (full time)	6	3.2	20	7.4	+233.3
Weeks less than 40 hours	90	47.1	104	38.7	+15.6
" more " 40 "	95	49.7	145	53.9	+52.6
Total weeks 40 hours and over	101	52.9	165	61.3	+63.4
Weeks 24 hours and less	43	22.5	56	20.8	+30.2
" 48 " " over	42	22.0	42	15.6	0.0

[a] By a labor-week (or "week") is meant any number of hours which one man worked during any one of the four calendar weeks.

[b] Corresponding data for the day shift were presented in the text, page 35.

TABLE 17.- TOTAL LABOR-WEEKS[a] (DAY AND NIGHT SHIFTS COMBINED) WORKED BY PRESSMEN AND ASSISTANTS IN 6[b] LARGE NEW YORK CITY PRESSROOMS AND IN 3 PRESSROOMS IN AND NEAR CHICAGO DURING FOUR WEEKS OF MARCH 1924 AND MARCH 1929

ITEM	NEW YORK CITY					CHICAGO				
	1924		1929		Per cent change 1924-29	1924		1929		Per cent change 1924-29
	Labor weeks	Per cent of total	Labor weeks	Per cent of total		Labor weeks	Per cent of total	Labor weeks	Per cent of total	
Total "weeks"	1,295	100.0	1,574	100.0	+21.5	2,217	100.0	3,530	100.0	+59.2
44-hour weeks (full time in New York)	227	17.5	304	19.3	+33.9	293[c]	13.2	431[c]	12.2	+47.1
Weeks of less than 44 hours	404	31.2	454	28.9	+12.4	449[c]	20.3	694[c]	19.7	+54.6
Weeks of more than 44 hours	664	51.3	816	51.8	+22.9	1,475[c]	66.5	2,405[c]	68.1	+63.1
Total weeks of 44 hours and over	891	68.8	1,120	71.2	+25.7	1,768[c]	79.7	2,836[c]	80.3	+60.4
48 to 50-hour weeks (full time in Chicago)						751	33.9	1,049	29.7	+39.7
Weeks of less than 48 hours						782	35.3	1,232	34.9	+57.5
Weeks of more than 50 hours						684	30.8	1,249	35.4	+82.7
Total weeks of 48 hours and over						1,435	64.7	2,298	65.1	+60.1

[a] By a labor-week (or "week") is meant any number of hours which one man worked during any one of the four weeks.

[b] One of these pressrooms did not work at night.

[c] For Chicago, 44-45-hour labor-weeks were combined to compare with the 44-hour full-time week in New York City. In Chicago, few 44-hour weeks occurred, whereas the 45-hour week was frequent because of the 9-hour day. In New York City the number of 45-hour weeks was negligible.

TABLE 18. - DAYTIME HOURS WORKED BY PRESSMEN AND ASSISTANTS IN SIX LARGE NEW YORK CITY PLANTS
Straight-time and overtime shown separately.

WEEKLY INTERVALS	YEAR	PRESSMEN					ASSISTANTS				
		Number Employed	Percentage of Total Pressmen	Av. No. Hours (Total)	Av. Hrs. Straight Time	Av. Hrs. Over-time	Number Employed	Percentage of Total Assistants	Av. No. Hours (Total)	Av. Hrs. Straight Time	Av. Hrs. Over-time
4 full weeks (straight time = 176 hrs.)	1924	46	43.8	192.6	176.0	16.6	49	29.7	196.3	176.0	20.3
	1929	41	32.5	190.9	176.0	14.9	38	20.9	192.2	176.0	16.2
3 full weeks and less than 4 (132-175 hrs. of straight-time)	1924	43	40.9	180.5	164.0	16.5	79	47.9	179.5	161.5	18.0
	1929	68	54.0	181.6	164.8	16.8	104	57.1	179.4	161.3	18.1
2 full weeks and less than 3 (88-131 hrs. of straight-time)	1924	3	2.9	125.0	112.0	13.0	11	6.6	121.9	111.5	10.4
	1929	6	4.8	114.2	106.0	8.2	6	3.3	113.3	102.0	11.3
1 full week and less than 2 (44-87 hrs. of straight-time)	1924	3	2.9	79.0	73.3	5.7	13	7.9	68.1	61.4	6.7
	1929	6	4.8	64.3	61.0	3.3	14	7.7	62.1	58.3	3.8
Less than 1 full week (straight-time under 44 hrs.)	1924	10	9.5	22.1	21.1	1.0	13	7.9	24.7	21.8	2.9
	1929	5	3.9	34.6	30.4	4.2	20	11.0	21.2	18.4	2.8
Total in 4 weeks	1924	105	100.0	166.2	151.6	14.6	165	100.0	159.7	143.6	16.1
	1929	126	100.0	170.0	155.4	14.6	182	100.0	153.5	138.8	14.7

TABLE 19. - NIGHT-SHIFT HOURS WORKED BY PRESSMEN AND ASSISTANTS IN 5[a] LARGE NEW YORK CITY PLANTS
Straight-time and overtime shown separately.

WEEKLY INTERVALS	YEAR	PRESSMEN					ASSISTANTS				
		Number Employed	Percentage of Total Pressmen	Av. No. Hours (Total)	Av. Hrs. Straight Time	Av. Hrs. Over-time	Number Employed	Percentage of Total Assistants	Av. No. Hours (Total)	Av. Hrs. Straight Time	Av. Hrs. Over-time
4 full weeks (straight-time = 160 hrs.)	1924	6	16.2	189.8	160.0	29.8	7	10.5	186.6	160.0	26.6
	1929	21	35.0	177.0	160.0	17.0	25	29.4	178.6	160.0	18.6
3 full weeks and less than 4 (120-159 hrs. of straight-time)	1924	14	37.9	167.5	146.9	20.6	24	35.8	173.4	146.0	27.4
	1929	14	23.3	149.1	133.4	16.4	20	23.5	161.1	138.8	22.3
2 full weeks and less than 3 (80-119 hrs. of straight-time)	1924	4	10.8	109.3	101.0	8.3	4	6.0	110.3	100.0	10.3
	1929	4	6.7	100.0	90.0	10.0	10	11.8	108.8	92.8	16.0
1 full week and less than 2 (40-79 hrs. of straight-time)	1924	6	16.2	63.0	56.0	7.0	11	16.4	61.1	54.1	7.0
	1929	7	11.7	62.6	53.7	8.9	9	10.6	64.8	54.2	10.6
Less than 1 full week (straight-time under 44 hrs.)	1924	7	18.9	19.1	17.1	2.0	21	31.3	16.2	14.5	1.7
	1929	14	23.3	16.7	15.4	1.3	21	24.7	15.6	13.3	2.3
Total in 4 weeks	1924	37	100.0	119.8	104.8	15.0	67	100.0	103.3	88.4	14.9
	1929	60	100.0	114.4	103.0	11.8	85	100.0	113.9	99.7	14.2

[a] The sixth plant for which daytime hours are presented in table 18 did not operate a night-shift.

TABLE 20.- TOTAL DAY-SHIFT-CAPACITY HOURS[a] OF PRESSES BY GROUPS, AND TOTAL HOURS ACTUALLY CHARGED[b] IN 5 LARGE NEW YORK CITY UNION PLANTS FOR THE YEARS 1923-1924 AND 1928-1929[c], SHOWING PERCENTAGES OF CHANGE

PRESS GROUP	1923-1924			1928-1929		
	Machine-Hours		Ratio Chargeable to Possible	Machine-Hours		Ratio Chargeable to Possible[d]
	Chargeable	Possible (Day-shift Capacity)		Chargeable	Possible (Day-shift Capacity)	
Platens	29,506	44,320	66.6	20,703	28,704	72.1
Job automatics	26,878	24,376	110.3	43,607	37,536	119.2
Small cylinders	17,677	15,512	114.0	17,830	17,664	100.9
Large cylinders	190,576	243,117	127.5	240,162	194,304	123.6
Two-color and perfecting presses	43,340	46,536	93.1	80,495	64,032	125.7
Rotaries	10,915	17,728	61.6	8,799	6,624	132.8
Total	371,433	339,048	109.1	411,596	348,864	118.0

[a] Day-shift-capacity, or total possible, hours were calculated for each of the two periods, first, by counting the actual number of hours it was possible by trade agreement for the men to have worked on straight-time -- 8 hours on week days and 4 hours on Saturdays with 10 holidays during the year, making a total of 2216 hours for the 12 months in 1923-24 and 2208 hours for 1928-29. These hours were then multiplied by the number of presses on the floors in the 2 periods. (Presses are considered to be in use during the time the men are making ready as well as when they are actually printing the impressions.)

[b] Chargeable hours are the total "productive hours" of the presses. This is the sum of the time expended in making ready the forms plus the actual running time.

[c] These two periods were composed of the 12 months from July 1, 1923 to July 1, 1924 and from July 1, 1928 to July 1, 1929.

[d] Any ratio which runs over 100 per cent necessarily indicates overtime or night work, and that the presses were in use more than for the regular day-shift of 8 hours. This does not mean, of course, that chargeable hours figures as taken from the plants include no night work and overtime even though equipment may have been partly idle during the day-shift. In other words, there is not ordinarily as compact a use of printing machinery as is suggested by these ratios, but this fact in no way weakens them as indexes of machine employment.

TABLE 21.- RATIOS OF TOTAL CHARGEABLE HOURS TO DAY-SHIFT-CAPACITY HOURS[a] BY PRESS GROUPS IN 5 LARGE NEW YORK CITY UNION PLANTS FOR THE YEARS 1923-1924 AND 1928-1929[b]

PRESS GROUP	PRESSES ALL PLANTS		PLANT A		PLANT B		PLANT C		PLANT D		PLANT E		RATIOS ALL PLANTS	
	1924	1929	1924	1929	1924	1929	1924	1929	1924	1929	1924	1929	1924	1929
Platens	20	13	-	-	82.2	71.2	55.9	74.9	69.8	70.6	-	-	66.6	72.1
Job-automatics	11 -	- 26	-	-	117.4	135.0	131.7	109.6	72.1	79.1	-	124.9	110.3	119.2
Small cylinders	7	14	-	-	79.4	107.6	-	100.9	127.8	97.0	-	-	114.0	100.9
Large cylinders	86	88	62.4	67.6	100.8	116.2	149.5	136.4	85.9	84.1	171.6	163.1	127.5	123.6
Two-color and perfecting presses	21	29	85.5	122.6	91.6	147.0	119.3	140.7	107.8	109.7	-	-	93.1	125.7
Rotaries	8	3	42.7	-	-	-	-	-	72.9 -	132.8	-	-	61.6	132.8
All presses	153	173	61.4	107.3	95.5	117.0	128.6	120.9	90.2	92.9	171.6	152.0	109.1	117.7

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[a] Explanation of these terms is made in footnotes to appendix table 20.

[b] These two periods were composed of the twelve months from July 1, 1923 to July 1, 1924 and July 1, 1928 to July 1, 1929.

TABLE 22.- TOTAL CHARGEABLE AND DAY-SHIFT-CAPACITY HOURS AND THEIR RATIOS[a], BY PRESS GROUPS, IN TWO PLANTS IN AND NEAR CHICAGO, AND RATIOS OF MAKE-READY TO RUNNING HOURS IN ONE OF THESE PLANTS, 1923-1924 AND 1928-1929[b]

PRESS GROUP	PRESSES	MACHINE HOURS		RATIO CHARGEABLE TO POSSIBLE			RATIO MAKE-READY TO RUNNING HOURS
		Chargeable	Possible (day-shift capacity)				
	Plants A and B (combined)				Plant A	Plant B	Plant A
1923-1924							
Platens	28	35,342	62,176	56.8	69.6	39.8	85.6
Job-automatics							83.9
Small cylinders	7	9,470	15,536	61.0	70.0	54.1	84.8
Large cylinders	52	193,563	115,480	167.6	199.2	120.8	50.4
Two-color and perfecting presses	31	96,053	68,792	139.6	177.4	115.7	21.2
Offset presses	7	13,895	15,568	89.3	89.3	-	53.1
Rotaries	72	239,409	159,752	149.9	138.0	156.2	24.2
Combined equipment	197	587,732	437,304	134.4	145.8	124.0	40.3
1928-1929							
Platens	20	58,235	44,160	131.9	148.4	111.6	96.9
Job-automatics							58.8
Small cylinders	5	13,053	11,040	118.2	160.3	55.2	76.9
Large cylinders	53	158,725	117,024	135.6	132.7	141.8	69.4
Two-color and perfecting presses	38	157,904	83,904	188.2	179.6	195.9	28.3
Offset presses	8	16,955	17,664	96.0	96.0	-	56.8
Rotaries	120	341,325	264,960	128.8	134.7	126.2	22.2
Combined equipment	244	746,197	538,752	138.5	140.5	136.8	41.9

[a] Explanation of these terms is made in footnotes to appendix table 20.

[b] These two periods are composed of the 12 months from July 1, 1923 to July 1, 1924 and from July 1, 1928 to July 1, 1929.

TABLE 23.- RATIOS OF MAKE-READY HOURS TO RUNNING HOURS BY PRESS GROUPS IN EACH OF SIX LARGE NEW YORK CITY UNION PLANTS FOR THE YEARS 1923-1924 AND 1928-1929[a], SHOWING PERCENTAGES OF CHANGE

PRESS GROUP	PRESSES, ALL PLANTS		PLANT A		PLANT B		PLANT C		PLANT D		PLANT E		PLANT F		RATIOS, ALL PLANTS	
	1924	1929	1924	1929	1924	1929	1924	1929	1924	1929	1924	1929	1924	1929	1924	1929
Platens	24	15	-	-	48.4	66.0	87.0	103.8	67.1	64.5	-	-	46.5	78.8	63.9	76.2
Job-automatics	13	28	-	-	49.2	58.2	92.8	136.3	34.6	37.4	-	23.1	64.3	77.6	62.1	52.6
Small cylinders	8	15	-	-	47.4	48.1	-	97.9	37.5	51.1	-	-	45.5	35.5	40.1	64.5
Large cylinders	96	97	78.7	59.6	41.2	53.9	53.7	55.0	35.6	47.3	30.4	31.2	66.9	42.5	46.1	45.1
Two-color and perfecting presses	23	33	37.2	34.0	44.4	52.0	62.0 -	- 78.2	48.4	73.0	-	-	87.0	57.1	51.4	55.6
Rotaries	8	3	-	-	-	-	-	-	34.5	39.8	-	-	-	-	34.5	39.8
All presses	172	191	53.1	41.4	45.8	55.7	58.9	68.4	39.8	53.2	30.4	29.2	65.4	50.3	48.5	50.5

[a] These two periods were composed of the twelve months from July 1, 1923 to July 1, 1924 and July 1, 1928 to July 1, 1929.

APPENDIX B

EXHIBIT 1.- CHRONOLOGICAL RECORD OF THE INTRODUCTION OF MODERN COMMERCIAL PRINTING MACHINES[a]

1830-1860	First power platen presses, followed by improved models.
1882	First reported modern single-cylinder flat-bed presses, probably preceded several years by experimental models.
1890	First modern magazine-rotary presses.
1899-1903	First automatic pile and continuous-feeding machines for cylinder presses.
1910-1919	First automatic feeding machines for platen presses.
1910	First two-color and perfecting flat-bed cylinder presses.
1914	First and only job-automatic cylinder press until 1922.
1914	First platen-automatic presses.
1922	Two more job-automatic cylinder presses.
1922	First and only automatic small-cylinder press, in group 29" - 42", until 1925.
1925-1928	More automatic small-cylinder presses in groups 22" - 29" and 29" - 42".
1927	Another platen automatic press.
1930-1931	First two-color automatic small-cylinder presses, in groups 29" - 42".

---

[a] Offset presses are not included in this list because they are not commercial printing presses and have only recently been used for commercial printing.

EXHIBIT 2.- COMMERCIAL PRINTING PRESSES IN USE AS OF JANUARY 1, 1929, CLASSIFIED AND LISTED BY TRADE NAMES, FOR WHICH TOTAL ANNUAL DOMESTIC SALES DURING THE SIXTEEN YEARS 1913-1928 WERE SUPPLIED BY THEIR MANUFACTURERS OR PATENT OWNERS

PLATENS	FLAT-BED CYLINDERS					
	Job Automatics (under 22")	Small Cylinders		Large Cylinders		Two-Color and Perfecting Presses
		Over 22" incl. 29"	Over 29" incl. 42"	Over 42" incl. 68"	Over 68"	
Chandler & Price Box Colt's Armory (3 sizes) Chandler & Price Craftsman Chandler & Price Craftsman Automatic* Miller Craftsman Unit* Heidelberg* Kluge-Craftsman Efficiency Unit* Kluge New Series Efficiency Unit* Laureate Miller Ideal Unit* (3 sizes) Miller Master Speed Jobber* Chandler & Price New Series (3 sizes)	Chandler & Price Small Automatic Cylinder* Style A Kelly* Style B Kelly* Miehle Vertical* Miller High Speed*	Miehle Horizontal* Miller Simplex* Whitlock Pony	Babcock Automatic* (2 sizes) Babcock One-Revolution Babcock Pony Optimus (2 sizes) Huber-Hodgman (2 sizes) Kelly No. 2* Miehle (3 sizes) Miehle Pony Miehle Automatic Units* (4 sizes including Miehle Pony Unit) Premier Two-Revolution Whitlock Pony	Babcock Automatic* Babcock Optimus (6 sizes) Premier Two-Revolution (5 sizes) Miehle (8 sizes) Huber-Hodgman (5 sizes)	Miehle	Miehle Two-Color (4 sizes) Miehle Perfecting (3 sizes)

ROTARIES [a]	
Sheet-Fed	Web-Fed
Babcock Two-Color Harris*	Goss Magazine Printing and Folding Machines (made to order in many sizes and special designs) Hoe Magazine and Periodical Rotary-Web Perfecting Presses (made to order in many sizes and special designs)

NOTE: Although this table offers no pretense of being exhaustively complete, with one exception the omissions are inconsequential in this study, as they are composed largely of platen models, only a few of which were ever sold. The omission of Cottrell magazine rotary presses through inability to secure the data is serious and has made it impossible to use fully the data submitted by the other two manufacturers of magazine-rotary presses.

* An asterisk marks the presses to which manufacturers themselves attached automatic feeders before sale and those having automatic feeders within their own mechanisms. The number of sizes of presses is given only when it is more than one.

[a] Rotary-offset presses (single- and multi-color) are being installed in increasing numbers by commercial printers but so far they are much more generally found in lithographing shops. For this reason the sales of these presses are not presented in the present study, although they and the feeders to be attached to them were reported by all of their manufacturers - Harris-Seybold-Potter Company, R. Hoe & Company, Inc., Miehle Printing Press & Manufacturing Company and the Dexter Folder Company.

EXHIBIT 3. - MANUFACTURERS AND PATENT OWNERS OF COMMERCIAL PRINTING PRESSES WHO COÖPERATED IN THIS INVESTIGATION BY SUBMITTING SALES RECORDS FOR THEIR PRESSES FOR THE SIXTEEN-YEAR PERIOD 1913-1928[a]

American Type Founders Company, Elizabeth, New Jersey
    Job-automatic and small cylinder presses - Kelly models.

Babcock Printing Press Manufacturing Company, The, New London Connecticut
    Large and small single-cylinder flat-bed presses.
    Two-color sheet-fed rotary presses.

Brandtjen & Kluge, Inc., Saint Paul, Minnesota
    Platen presses.

Chandler & Price Company, The, Cleveland, Ohio
    Platen and job-automatic cylinder presses.

Goss Printing Press Company, The, Chicago, Illinois
    Magazine rotary-web presses.

Harris-Seybold-Potter Company, Cleveland, Ohio
    Large and small single-cylinder presses -- Premier and Whitlock models.
    Rotary-offset presses -- Harris and Potter models.
    Sheet-fed rotary presses -- Harris model.

Heidelberg Automatic Platen Company, The, American Office, New York City, N. Y.
    Platen presses.

Hoe, R., & Company, Inc. New York City, New York
    Magazine rotary-web presses.

Miehle Printing Press & Manufacturing Company, Chicago, Illinois.
    Job-automatic, small and large single-cylinder presses including Huber-Hodgman models.
    Two-color and perfecting flat-bed cylinder presses.
    Rotary-offset presses.

Miller Printing Machinery Company, Pittsburgh, Pennsylvania
    Platen, job-automatic and small cylinder presses.

Thompson-National Press Company, Franklin, Massachusetts
    Platen presses.

---

[a] With one exception this is the complete list of important commercial printing-press manufacturers. The exception is explained in the Note for exhibit 2.

EXHIBIT 4.- MANUFACTURERS AND PATENT OWNERS OF AUTOMATIC FEEDING ATTACHMENTS WHO COÖPERATED IN THIS INVESTIGATION BY SUBMITTING SALES RECORDS FOR THEIR FEEDERS (WHICH ARE LISTED BY TRADE NAMES) FOR THE SIXTEEN-YEAR PERIOD 1913-1928[a]

American Type Founders Company, Elizabeth, New Jersey
- Humana, Klymax and Peerless Feeders (for platen presses).

Brandtjen & Kluge, Inc., Saint Paul, Minnesota
- Kluge Automatic Feeders (for platen presses).

Dexter Folder Company, New York City, New York
- Cross Continuous Feeders - for flat-bed cylinder, sheet-fed rotary and rotary-offset presses.
- Dexter Pile Feeders and Dexter Suction Pile Feeders (for flat-bed cylinder, sheet-fed rotary and rotary-offset presses).
- Swart Feeders (for flat-bed cylinder presses).

Miller Printing Machinery Company, Pittsburgh, Pennsylvania
- Miller Single Feeders (for platen presses).
- Craftsman Single Feeders (for platen presses).

---

[a] A few of the early makes of automatic feeders are not included, but as they were installed in relatively small numbers their omission is unimportant in the present study.

EXHIBIT 5.- NEW YORK CITY PRINTING FIRMS WHO COÖPERATED IN THIS INVESTIGATION[a] BY SUBMITTING INFORMATION OR BY PERMITTING IT TO BE GATHERED IN THEIR PRESSROOMS

Afferton Press
Alliance Printing Corporation
American Colortype Co.
Anderson, Jawood L., Inc.
Barnes Press, Inc.
Barnes Printing Co.
Barr-Erhardt Press, Inc.
Basso, M. P., & Co.
Blackstone-Canfora Press, Inc.
Blanchard Press, Inc.
Brooklyn Daily Eagle, The, Inc.
Bryant Press, Inc.
Chauncey-Holt Printing Co.
Circle Press, Inc.
Clark and Fritts
Clark's, S. J., Sons, Inc.
Claydon Printing Co.
Commanday-Roth Co., Inc.
Conway Printing Co.
Davidson Press, Inc.
Diamond Press, The
Eilert Printing Co., Inc.
Federal Printing Co., Inc.
Fisher & Thul, Inc.
Fleming & Reavely, Inc.
Francis Press, Charles, Inc.
Fulton Press
Funk & Wagnalls Co., Inc.
Goldmann, Isaac, Co., Inc.
Gotham Press, Inc.
Hamilton Press, Inc.
Johnston, James N., Inc.
Kalkhoff Company, Inc.
Kess & Harris Press, Inc.
Kiernan-Jones Corporation
Lent & Graff Co., Inc.
Lenz & Riecker, Inc.
McGraw-Hill Company, Inc.
Marlin Printing Co.
Middleditch, L., Co., Inc.
Montross & Clark Co., Inc.
Moore Press, The, Inc.
Moscow, Daniel
New York World, Job Print Department
O'Brien, C. J., Inc.
O'Connor, M. A.
Rankin Co., John C., Inc.
Roy Press Printing Co.
Schilling Press, The, Inc.
Stillson Press, The, Inc.
Technical Press, The, Inc.
Ullman Press, The, Inc.
Wander Press, The
Winson Press, Inc.

[a] Because of the small number of coöperating firms outside of New York City and the fragmentary nature of the data for two of these concerns, the author regretfully decided it impracticable to list their names.

EXHIBIT 6. - SCHEDULE USED IN THE SURVEY OF PRESSES ON THE FLOOR AND MEN CUSTOMARILY EMPLOYED IN 44 REPRESENTATIVE MEDIUM-SIZE PLANTS (36 UNION AND 8 NON-UNION) IN NEW YORK CITY; WINTER OF 1923-1924 AND WINTER OF 1928-1929

Date collected ____________________

Plant ____________________ Address ____________________

Name of Informant ____________________ Position ____________ Tel. No. ____________

Press Machines on the Floor Winter of 1923-1924

1. Platen			2. Small High-Speed Cylinder (Under 42")			3. Large Cyl. (42" & Over) (Include 2-color, perfecting and rotary)		
Name and Bed-Size	Number		Name and Bed-Size	Number		Name and Bed-Size	Number	
	Hand Fed	Mach. Fed		Hand	Mach.		Hand	Mach.

Number of Men Customarily[a] Employed for Day Work on Above Presses

Pressmen ____________ Pressmen ____________ Pressmen ____________

Feeders: Mach.___ Hand___ Feeders: Mach.___ Hand___ Feeders: Mach.___ Hand___

Press Machines on the Floor Winter of 1928-1929

1. Platen			2. Small High-Speed Cylinder (Under 42")			3. Large Cyl. (42" & Over) (Include 2-color, perfecting and rotary)		
Name and Bed-Size	Number		Name and Bed-Size	Number		Name and Bed-Size	Number	
	Hand Fed	Mach. Fed		Hand	Mach.		Hand	Mach.

Number of Men Customarily[a] Employed for Day Work on Above Presses

Pressmen ____________ Pressmen ____________ Pressmen ____________

Feeders: Mach.___ Hand___ Feeders: Mach.___ Hand___ Feeders: Mach.___ Hand___

Remarks:

---

[a] The interpretation of this term offered some difficulties. Commercial presswork is irregular and labor turnover is high. However, the volume of business tends to shake down into what might be called "normal activity", when certain machines or a certain percentage of the equipment is running operated by a certain number of men. This was the complement recorded as "customarily" or "regularly" employed. Again, because pressworkers operate different machines and some assistants both hand-feed and operate automatic feeders, it was difficult to specify the exact nature of the men's work. In borderline cases, therefore, men were listed on the schedules for work at which they were customarily occupied, and a sign was made to indicate the alternative occupation. The tabulations of equipment and men were then made according to the entries on the schedules, but the signs of alternative occupations served to guide the interpretation of the summaries drawn from them.

EXHIBIT 7. - SCHEDULE USED IN THE SURVEY OF PRESSES ON THE FLOOR AND MEN CUSTOMARILY EMPLOYED IN 9 LARGE REPRESENTATIVE PLANTS IN NEW YORK CITY; WINTER OF 1923-1924 AND WINTER OF 1928-1929[a]

Date collected ____________________

Plant ____________________ Address ____________________

Name of Informant ____________________ Position __________ Tel. No. __________

Press Machines on the Floor Winter of 1923-1924[b]

I. Platen			II. Job Cylinders (Under 42")			III. Large Cylinders (42" & Over) Single Color		
Name and Bed-Size	Number Hand Fed	Number Mach. Fed	Name and Bed-Size	Number Hand	Number Mach.	Name and Bed-Size	Number Hand	Number Mach.

Number of Men Customarily[c] Employed for Day Work on Above Presses

Pressmen ______	Pressmen ______	Pressmen ______
Apprentice pressmen ______	Apprentice pressmen ______	Apprentice pressmen ______
Feeders: Mach. ___ Hand ___	Feeders: Mach. ___ Hand ___	Feeders: Mach. ___ Hand ___
Apprentice feeders: Mach. ___ Hand ___	Apprentice feeders: Mach. ___ Hand ___	Apprentice feeders: Mach. ___ Hand ___

IV. Large Cylinder (42" & Over) Color & perfecting presses			V. Rotary - Offset, sheet-fed, web, color, McKee (State whether offset-roll, etc.)		
Name and Bed-Size	Number Hand	Number Mach.	Name and Bed-Size	Number Hand	Number Mach.

Pressmen ______
Apprentice pressmen ______
2-color " ______
Perfecting " ______
Feeders: Mach. ___ Hand ___
App. " : " ___ " ___

NUMBER OF MEN CUSTOMARILY EMPLOYED FOR DAY WORK ON ROTARY PRESSES

Pressmen ______
Web-pressmen ______
2nd web " ______
Brakemen ______
Tension-men ______
McKee pressmen ______
Web feeder-operators ______
2-color pressmen ______
Apprentice " ______
Feeders: Mach. ___ Hand ___
Apprentice feeders: Mach. ___ Hand ___
Utility men ______
McKee operators ______
" button boys ______

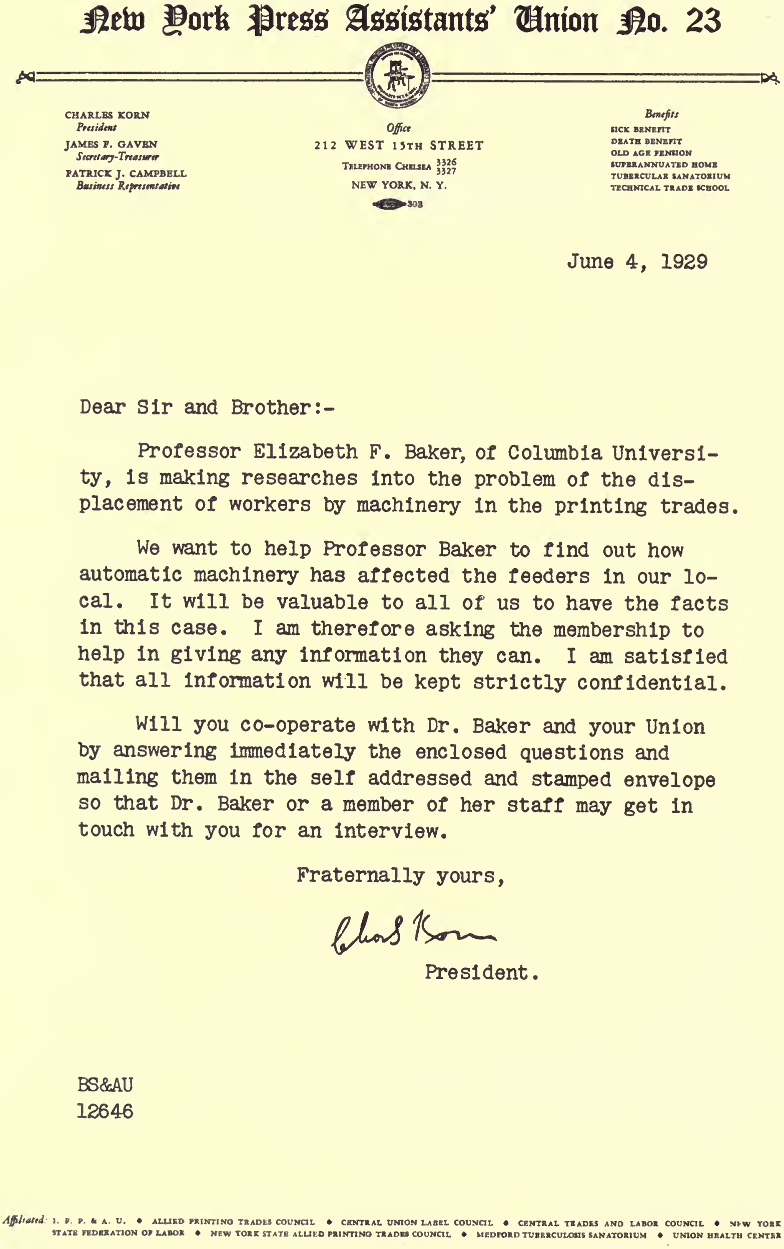
---

[a] The schedules used in the three plants outside of New York City, owing to the great variety of their equipment, were much more extensive and detailed than this, but it seemed unnecessary to include them among the exhibits.

[b] Same schedule was used for 1928-1929.

[c] This term is explained in the footnote for exhibit 6.

EXHIBIT 8. - SPECIAL LETTER AND FORM SENT TO TWENTY PRESS ASSISTANTS WHOSE NAMES WERE GIVEN BY VARIOUS INFORMANTS AS MEN WHO HAD BEEN DISPLACED BY TECHNOLOGICAL CHANGE



New York Press Assistants' Union No. 23

CHARLES KORN
President
JAMES F. GAVEN
Secretary-Treasurer
PATRICK J. CAMPBELL
Business Representative

Office
212 WEST 15TH STREET
TELEPHONE CHELSEA 3326 3327
NEW YORK, N. Y.

Benefits
SICK BENEFIT
DEATH BENEFIT
OLD AGE PENSION
SUPERANNUATED HOME
TUBERCULAR SANATORIUM
TECHNICAL TRADE SCHOOL

June 4, 1929

Dear Sir and Brother:-

Professor Elizabeth F. Baker, of Columbia University, is making researches into the problem of the displacement of workers by machinery in the printing trades.

We want to help Professor Baker to find out how automatic machinery has affected the feeders in our local. It will be valuable to all of us to have the facts in this case. I am therefore asking the membership to help in giving any information they can. I am satisfied that all information will be kept strictly confidential.

Will you co-operate with Dr. Baker and your Union by answering immediately the enclosed questions and mailing them in the self addressed and stamped envelope so that Dr. Baker or a member of her staff may get in touch with you for an interview.

Fraternally yours,

Chas Korn

President.

BS&AU
12646

Affiliated: I. P. P. & A. U. ◆ ALLIED PRINTING TRADES COUNCIL ◆ CENTRAL UNION LABEL COUNCIL ◆ CENTRAL TRADES AND LABOR COUNCIL ◆ NEW YORK STATE FEDERATION OF LABOR ◆ NEW YORK STATE ALLIED PRINTING TRADES COUNCIL ◆ MEDFORD TUBERCULOSIS SANATORIUM ◆ UNION HEALTH CENTER

FORM ACCOMPANYING LETTER FOR EXHIBIT 8

Information for Dr. Baker of Columbia University
Regarding the Displacement of Workers by Machinery

Name ______________________________ Date ________________

Home Address ______________________ Tel. no.
if any ______________

Where can you be reached for an interview? ____________

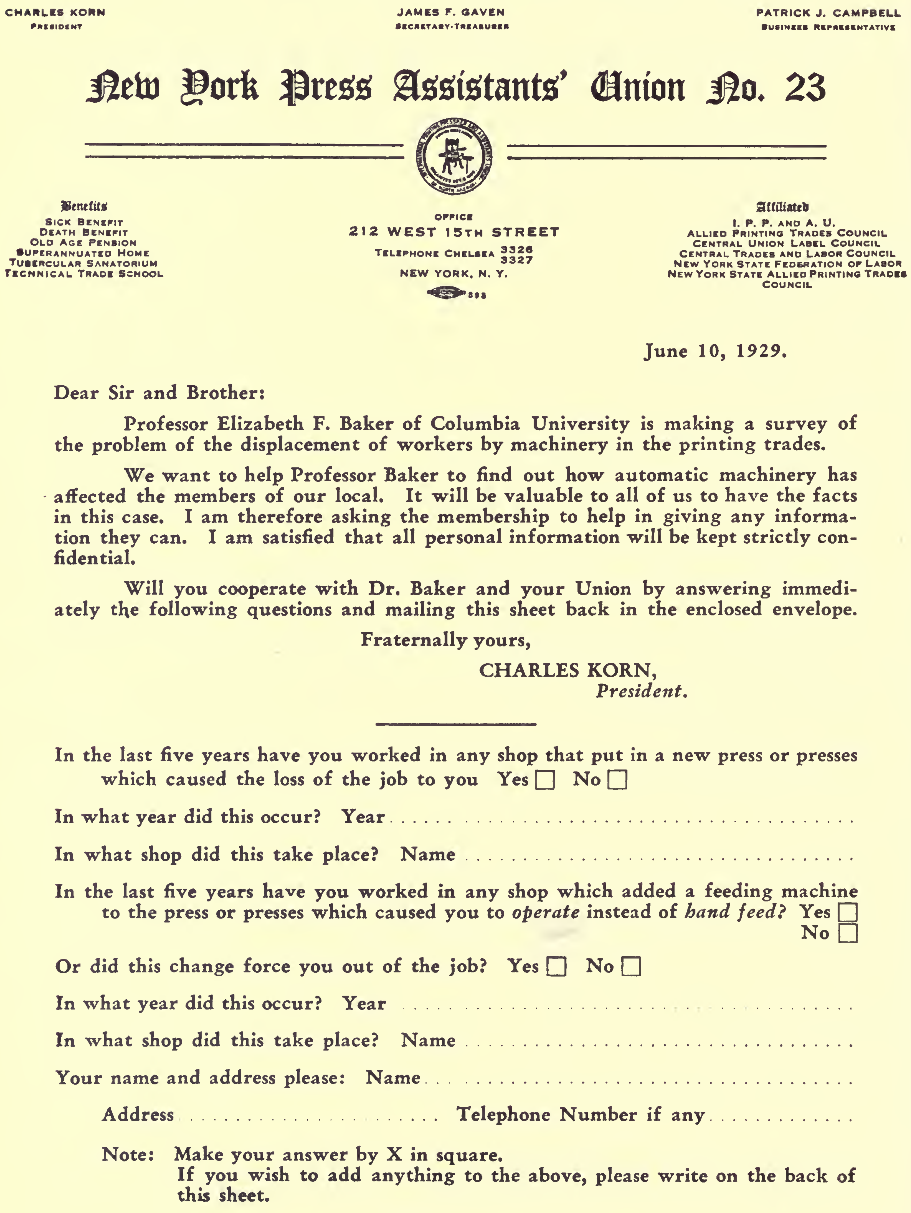
When - state date and hour ______________________________

Your President will appreciate your coöperation in replying promptly.

New York Printing Press Assistants' Union No. 23
212 West 15th Street, New York City

June 4, 1929

EXHIBIT 9. - CIRCULAR LETTER SENT TO 2,400 MEMBERS OF NEW YORK PRINTING PRESS ASSISTANTS' UNION NO. 23



CHARLES KORN
President

JAMES F. GAVEN
Secretary-Treasurer

PATRICK J. CAMPBELL
Business Representative

New York Press Assistants' Union No. 23

Benefits
Sick Benefit
Death Benefit
Old Age Pension
Superannuated Home
Tubercular Sanatorium
Technical Trade School

Office
212 WEST 15TH STREET
Telephone Chelsea 3326
3327
NEW YORK, N. Y.

Affiliated
I. P. P. and A. U.
Allied Printing Trades Council
Central Union Label Council
Central Trades and Labor Council
New York State Federation of Labor
New York State Allied Printing Trades Council

June 10, 1929.

Dear Sir and Brother:

Professor Elizabeth F. Baker of Columbia University is making a survey of the problem of the displacement of workers by machinery in the printing trades.

We want to help Professor Baker to find out how automatic machinery has affected the members of our local. It will be valuable to all of us to have the facts in this case. I am therefore asking the membership to help in giving any information they can. I am satisfied that all personal information will be kept strictly confidential.

Will you cooperate with Dr. Baker and your Union by answering immediately the following questions and mailing this sheet back in the enclosed envelope.

Fraternally yours,
CHARLES KORN,
President.

In the last five years have you worked in any shop that put in a new press or presses which caused the loss of the job to you Yes ☐ No ☐

In what year did this occur? Year . . . .

In what shop did this take place? Name . . . .

In the last five years have you worked in any shop which added a feeding machine to the press or presses which caused you to *operate* instead of *hand feed?* Yes ☐ No ☐

Or did this change force you out of the job? Yes ☐ No ☐

In what year did this occur? Year . . . .

In what shop did this take place? Name . . . .

Your name and address please: Name . . . .

Address . . . . Telephone Number if any . . . .

Note: Make your answer by X in square.
If you wish to add anything to the above, please write on the back of this sheet.

EXHIBIT 10. - SAMPLE LETTERS SENT TO DISPLACED MEN ARRANGING FOR INTERVIEWS

a) Original interview

BARNARD COLLEGE
COLUMBIA UNIVERSITY
NEW YORK

DEPARTMENT OF
ECONOMICS AND SOCIOLOGY

June 13, 1929

Mr. B. G__________
1124 Stratford Ave.
New York City

Dear Mr. G____:

Thank you for replying so promptly to Mr. Korn's letter in regard to the study which I am making of the effect of automatic machinery on the employment of feeders. I want very much to arrange for an interview with you. Could you meet me or a member of my staff in the Union offices, 212 West 15th Street, on Saturday, June 15, between 1 and 5 o'clock?

Please telephone me on Friday evening after 7 o'clock at my home, Monument 2930, whether you can come for a conference.

If this is not convenient, will you please answer the following questions as to where and when you can be met, and return this in the self-addressed envelope herewith enclosed.

At the Union Headquarters:

Date ____________________ Hour ____________________

At home:

Date ____________________ Hour ____________________

At your lunch place:

Date ____________________ Hour ____________________
Its name
and address ____

Again thanking you for your assistance in this important survey, I am,

Sincerely yours,

Elizabeth F. Baker

Assistant Professor of Economics

EXHIBIT 10. - SAMPLE LETTERS SENT TO DISPLACED MEN ARRANGING FOR INTERVIEWS - Continued

b) Follow-up interview

BARNARD COLLEGE
COLUMBIA UNIVERSITY
NEW YORK

DEPARTMENT OF
ECONOMICS AND SOCIOLOGY

Dec. 26, 1929

Mr.______________
Bronx, N. Y. City.

My dear Mr.______

Last summer you gave me your kind assistance in my investigation of the effects of new machinery on the press assistants. You showed your interest by answering the questions put to you by me. I very much appreciated your coöperation.

Now I am going to ask you to answer the following questions about your work since the interview. Please use the reverse side of this paper if you need to, and return it to me in the enclosed envelope, for which no stamp is necessary.

With the earnest wish that things will go well with you in the New Year, I am,

Sincerely yours,
Elizabeth F. Baker

EFB:ABE

Assistant Professor of Economics

1. Are you employed now? . . . .

    In the printing industry? . . . .

        If so, are you hand-feeding? . . . .
        or operating an automatic? . . . .

        What kind of a press? . . . .

    If not in the printing industry,
    what is your present occupation? . . . .

2. Is your job steady? . . . .

3. How many days a week are you employed? . . . .

4. What wages are you getting? . . . .

5. How many weeks work have you had
since the interview on June 17, 1929? . . . .

EXHIBIT 11. - SCHEDULE OF INQUIRY USED IN THE INTERVIEWS WITH DISPLACED MEN

Name ____________ Age ______ Nativity ______
Address ______________________ Phone ______
Single ____ Md. ____ Wid. ____ No. children ____ Ages ______
Nature of home group: Dependents (total):
" (partial):

Year entered ptg. industry ___ at age of ___ Date joined union ______

WHERE EMPL. LONGEST: Firm ________ Dates ______
Occupation ____________ Length of empl. ______

OCCUPATION AT TIME (Hand ______
OF TECHNICAL CHANGE ____________ (Auto ______
Firm ________ Address ________ (Union ______
(Open ______

How long empl. ______ Dates ______ Describe change:
Av. days a wk. ______ Av. wkly. earnings ______
" wks. a yr. ______ " yrly. " ______
Month of change ______
Quit ______ Lay-off ______ Tsfr. to what ______
Month of separation ______
HOW LONG WERE YOU OUT? ______

FINANCIAL help: (during that time) Debts: (Own home: Yes ___ No ___)
Savings ________ Installments ______ No. children working ___
Family ________ Insurance ______ Wife working ______
Union ________ Other:
Other:

LATER financial help:

JOBS held up to present SINCE TECHNICAL CHANGE:

Occupations	Dates	Length of emplmt.	Earnings (Day, wk. or mo.)
1st job ____			
1st regular job ____			
Other jobs ____			
When ret'd to ptg. ____			

PRESENT OCCUPATION ____________ Date hired ______
(state whether hand or auto)
Firm ________ Address ________ (Union ______
(Open ______
Av. days a wk. ______ Av. wkly. earnings ______
" wks. a yr. ______ " yrly. " ______
UNEMPLOYED? ______ Since when? ______

By what other jobs could you earn a living?

Interviewed by Date

EXHIBIT 12. - STANDARD COMPLEMENT OF MEN AND RESPECTIVE WAGE SCALES PAID IN UNION SHOPS[a] BY GIVEN PRESS GROUPS IN NEW YORK CITY IN 1923-1924 AND IN 1928-1929

PRESS GROUP	METHOD OF FEEDING	COMPLEMENT OF MEN		WEEKLY WAGE SCALE[b]			
				1923-1924		1928-1929	
		1923-1924	1928-1929	Pressmen	Assistants	Pressmen	Assistants
Platens	Hand	1 pressman and 3 assistants to every 4 presses	Same as for 1923-1924	$43.00	$29.00	$47.00	$ 32.00
	Machine	1 pressman to 2 presses, no assistants	Same as for 1923-1924	47.00	-	51.00	-
Job-automatics	Machine	[c] 1 pressman to 2 presses with an assistant for special work[d]	[c] Same as for 1923-1924	48.00	29.00	56.00	32.00
Small cylinders 22"-29"	Hand	1 pressman to 2 presses 1 assistant to each	Same as for 1923-1924	48.00	29.00	59.00	35.00
	Machine	[c] 1 pressman and 1 assistant to 2 presses (usually only a boy at most)	[c] Same as for 1923-1924				
29"-42"	Hand	1 pressman to 2 presses 1 assistant to each press	Same as for 1923-1924	50.00	42.50	56.00	45.50
	Machine	[e] 1 pressman to 2 presses 1 assistant to each press	[e] 1 pressman and 1 assistant to 2 pile-fed presses except no assistant on odd presses	50.00	42.50	56.00 62.00 on odd presses	49.50
Large cylinders 42"-68"	Hand or machine	1 pressman to 2 presses 1 assistant to each	Same as for 1923-1924	50.00	42.50	56.00	45.50
Over 68"		1 pressman and 1 assistant to each press	Same as for 1923-1924				
Two-color cylinders and perfectors	Hand or machine	1 pressman and 1 assistant to each press	Same as for 1923-1924	53.00	44.50	59.00	48.50

Exhibit 12. - Continued

[f]Sheet-fed Rotary Offset	Machine	1 pressman and 1 assistant to each press	Same as for 1923-1924	56.00	44.50	62.00	48.50
[f]Rotary Web	Machine	1 pressman, 1 brakeman to each press, no assistants	Same as for 1923-1924	56.00 to 58.00	-	56.00 to 64.00	-
[f]Rotary Web with offset roll	Machine	1 pressman, 1 brakeman, 1 tension man to each press, no assistants	Same as for 1923-1924	56.00	-	56.00 to 64.00	-
[f]Sheet-fed Rotary	Machine	1 pressman and 1 assistant to each press	Same as for 1923-1924	53.00	44.50	59.00	48.50
[f]U.P.M.	Machine	1 pressman and 1 assistant to each press	All were removed before 1929	57.00	45.50	-	-
[f]McKee	Machine	1 pressman, 1 assistant and 1 button boy to each	All were removed before 1929	59.50	43.00 to 45.00	-	-

[a] In all cases "assistants" means members of New York Press Assistants' Union No. 23.

[b] The basic week in New York union shops was 44 hours in both periods.

[c] A dispute was raging in 1923-24 over the manning of the presses and no formal contract could be struck between Printers' League and Press Assistants' Union No. 23. This complement of men is presented after careful consultation with reliable informants and is the nearest description that can be made in tabular form of the nebulous regulations of that time. By 1928-29 these tacit agreements had become mandatory where indicated. Chapter VII tells the story of collective bargaining during these years.

[d] For half-tone and color work one assistant was employed for the two presses. In 1928-29 if an assistant was employed on black work it was agreed that he be a member of the union.

[e] This was the provision required by No. 23 and agreed to by the league. It does not uniformly describe actual practice because of the parallel agreement between the league and Pressmen's Union No. 51 which permitted a pressman to operate one of these presses without an assistant.

[f] Owing to the special character of some of these presses, special agreements were made between the owners and the unions regarding the number of men to be employed and the wages to be paid them. These special agreements are set down in this table and cannot be taken as the standard arrangement in all cases.

EXHIBIT 13. - THE COMPLEMENT OF MEN: PART VII OF THE CONTRACT FOR BOOK AND JOB OFFICES BETWEEN PRINTERS' LEAGUE SECTION OF THE NEW YORK EMPLOYING PRINTERS' ASSOCIATION AND NEW YORK PRINTING PRESSMEN'S UNION NO. 51, 1929-1932

66. The complement of men required when a press is running shall be employed while the press is being made ready. They shall be subject to the direction of the foreman to do any work required of them, provided such work shall not displace a regular employee. In the event of any press working overtime the man employed on said press shall be given preference to the overtime, except in cases of emergency.

67. In the event of the introduction of new processes or new machinery the complement of men required or other conditions shall be settled by mutual agreement before operation, later to be finally determined after a trial period mutually agreed upon. Such questions shall be settled by reference to the standing Joint Conference Committee of the League and the Union.

68. A pressman may run no more than two single-cylinder presses (68 inches or under, subject to Section 69), two automatic cylinder presses up to and including 29 inches, one perfecting press, one two-color press, one sheet-feet rotary, one offset press, one cylinder over 68 inches. He shall not run more than one automatic cylinder press up to and including 42 inches without an assistant, nor shall he run two presses on separate floors.

69. A survey shall be taken after one year of signing of contract and attention of the International Union shall be called to enforce conditions throughout its jurisdiction in enforcements of the law, it being understood that when this law regarding size of press is enforced throughout its jurisdiction, Section 68 shall be then subject to revision.

70. Complement of Men on Web Presses: A first pressman on all web presses. Second pressman required on double-roll presses of any size when two rolls are running or on single-roll web presses having one or more of the following attachments when in operation, stitching, pasting, covering or inserting; and on single-roll web presses 60 inches or over, having one or more color attachments in operation. Second man required where the details of the work make it necessary. Brakemen pressmen required on all size web presses. Tension pressmen required on all offset rolls when in operation. Operator required for one or two automatic feeders, more operators required where the details of the work make it necessary.

EXHIBIT 14. - THE COMPLEMENT OF MEN: PART VII OF THE CONTRACT FOR BOOK AND JOB OFFICES BETWEEN PRINTERS' LEAGUE SECTION OF THE NEW YORK EMPLOYING PRINTERS' ASSOCIATION AND NEW YORK PRINTING PRESS ASSISTANTS' UNION NO. 23, 1929-1932

55. The complement of men required when a press is running shall be employed while the press is being made ready. They shall be subject to the direction of the foreman to do any work required of them, provided such work shall not displace a regular employee. In the event of any press working overtime the man employed on said press shall be given the overtime except in cases of emergency.

56. For every two automatic job cylinder presses not over 17 x 22 inches that are in operation on half-tone or color work, an assistant shall be employed who shall be a member of the Press Assistants' Union No. 23, Junior Branch. When an assistant is needed on black work he must be a journeyman member of the Junior Branch.

For every two job cylinder presses over 22 inches and up to and including 29 inches an assistant shall be employed who shall be a member of Press Assistants' Union No. 23, Junior Branch.

Where a senior assistant is displaced by the elimination of cylinder presses upon which he is working, by the introduction of presses of this type, it is recommended that a senior assistant be given preference at the senior scale.

For every two automatic job cylinder presses with pile feeders over 29 inches and up to and including 42 inches an assistant shall be employed who shall be a member of Press Assistants' Union No. 23, Senior Branch.

Where there is an odd machine such as is described in the preceding paragraph that can be combined with a small job cylinder, a Senior assistant shall be employed. Where an odd press cannot be combined with a small job cylinder it may be operated by a pressman without an assistant.

57. In the event of the introduction of new processes or new machinery, the complement of men required or other conditions shall be settled by mutual agreement before operation, later to be finally determined after a trial period mutually agreed upon. Such questions shall be settled by reference to the standing Joint Conference Committee of the League and the Union.

EXHIBIT 15.- FIRST SUPPLEMENTAL AGREEMENT TO THE CONTRACTS BETWEEN NEW YORK PRINTERS LEAGUE SECTION AND NEW YORK PRESSROOM UNIONS FOR 1929-1932[a]

Joint Commission Plan and Survey Printers League Section,
New York Employing Printers Association, Inc., and New York
Printing Pressmen's Union No. 51, New York Printing Press
Assistants' Union No. 23, and Paper Handlers and Sheet
Straighteners' Union No. 1, of the International Printing
Pressmen and Assistants' Union of North America.

The Joint Conference Committee of the Printers League, New York Printing Pressmen's Union No. 51, New York Printing Press Assistants' Union No. 23, and New York Paper Handlers' Union No. 1, shall constitute a commission in which are an equal number of votes being represented by the League on the one hand and by the unions on the other, whose duties shall be as follows:

1. Jointly to elect or select a Chairman and Secretary who shall respectively preside at all meetings and keep a correct copy of all proceedings.

2. Each party to investigate the general conditions of the industry in the City of New York.

3. Each party to make a survey of the automatic machines, grading the sizes, character of attachments and complement of men needed.

[a] Inconsistency in the spelling of Printers' League Section , New York Employing Printers' Association in text and exhibit titles of this book and the reproduced material is more apparent than real. In earlier years both the Printers' League and the Printers' Association were written with the apostrophe. In recent years the apostrophe has been dropped. It seemed advisable therefore to retain the apostrophe throughout the present work, except in these reproductions.

4. Each party to determine the number of men affected by any change which may be deemed necessary.

5. Each party to determine how the industry will absorb the men affected if a change is made, and to formulate some plan of action for this absorption.

6. Each party to submit a report to the Joint Conference Committee not later than six months after the beginning date of this contract. Where agreement is reached the results are to be incorporated as new sections in the existing contract within one month thereafter. On any points upon which mutual agreement is not reached within two months thereafter the matter shall be set forth within these two months by the respective parties and the Board of Directors of the International Printing Pressmen and Assistants' Union of North America in a mutual submission agreement and submitted to an arbitration board of three members jointly selected by the Joint Conference Committees and the Board of Directors of the International Printing Pressmen and Assistants' Union of North America. Provided, that where there are questions of conflict with International Law they shall be interpreted by the Board of Directors of the International Printing Pressmen and Assistants' Union of North America as to whether the issue is arbitrable under the laws of the International Printing Pressmen and Assistants' Union of North America. The principle of equal representation and voting power for the employers and the unions is to be maintained in the conciliation conferences and in the selection of this board.

Printers League Section, N.Y.E.P.A.

M. F. Hurley
Chairman of Committee

F. A. Silcox
Secretary

(Signed)

N.Y. Printing Pressmen's Union No. 51

James J. Conway
Chairman of Committee

Edward Neway
Secretary

N.Y. Press Assistants' Union No. 23

Charles Korn
Chairman

James F. Gavin, Secretary

Paper Handlers & Sheet Straighteners' Union No. 1

Vincent J. Ferris
Chairman

Thomas P. Gill, Secretary

Approved by authority of Board of Directors of the International Printing Pressmen and Assistants' Union of North America.

Wm. H. McHugh, First Vice President,
International Printing Pressmen and
Assistants' Union of North America

EXHIBIT 16. - SECOND SUPPLEMENTAL AGREEMENT TO THE CONTRACTS BETWEEN NEW YORK PRINTERS' LEAGUE SECTION AND NEW YORK PRESSROOM UNIONS FOR 1929-1932

Depression Adjustments

SUPPLEMENTAL AGREEMENT

THE undersigned president of the I. P. P. and A. U. of N. A., having been duly authorized with full power by New York Printing Pressmen's Union No. 51 and by New York Press Assistants' Union No. 23, constituent local unions of the I. P. P. and A. U. of N. A., and the undersigned, representing the Printers League Section of the New York Employing Printers' Association, Incorporated, having been duly authorized with full power by their constituent bodies to consider the existing emergency situation of the Commercial Book and Job Branch of the Printing Industry in New York City and if possible arrive at an agreement supplemental to the existing contract between the aforesaid parties, which agreement will furnish the local unions an opportunity to provide work for their unemployed members and, at the same time, give relief to the local printing Employers of New York City who, equally with the members of the local unions, find themselves involved in this very severe depression which they have not had any responsibility in making; do hereby in an earnest and sincere effort and hope inspired by the cooperation which has existed in our mutual relationship assume their unwelcome share in making a readjustment to restore the industry, of which they are a part, to happier conditions.

The undersigned, throughout their mutual discussions, have given first consideration to the problem of unemployment, and it has been their desire to arrive at an understanding, which would provide for some degree of adequate relief with the minimum sacrifice on the part of all. We, jointly, have not been unmindful of the serious responsibilities which you have entrusted to us. We have primarily been concerned all of the time with the human problems involved and the urgent necessity of immediately getting into effect at least an experimental plan of operation which in our mind promises some relief without delay. We have deeply felt that provisions should be made not only for our younger men now unfortunately out of work, but for the mechanics of our industry who have served faithfully through the years and who now because of age find themselves displaced. It is our sincere desire in our extension of this plan that we can eventually through some adjustment in compensation find work for such members, and it is our joint sincere assurance that our respective organizations will work to that end.

After careful consideration of the very difficult problem which has been assigned to us, we have arrived at the following agreement supplemental to the existing contracts now effective between the aforementioned organizations which we represent:

1. That all plants be required to absorb men in such a way as to distribute the available work to provide for approximately six hundred members of New York Printing Pressmen's Union No. 51 and six hundred members of New York Press Assistants' Union No. 23.
2. That to make this absorption practicable, that no member of the union be permitted to work more than four 8-hour days in any one fiscal week until the six hundred men of No. 51 and No. 23 are absorbed to the extent of getting at least one day's work per week.
3. That no firm shall work any member of the local unions more than four 8-hour days in any one fiscal week and shall so arrange a slide of their forces to absorb their proportionate share of the twelve hundred men now out of work who are to be taken care of under this agreement.
4. That any plant may work a full day on Saturday at single time rates provided that no member of the union, excepting the foreman, shall work more than four days per week.
5. That the forty-four hour week as established in the existing contract shall be considered basic in figuring the adjusted rates hereinafter provided.
6. That in the application of the four 8-hour day plan that the existing overtime provisions of the contracts now in effect shall be understood to continue.
7. That any plant which shall find it practicable to work a minimum of two 6-hour day shifts in any one day shall operate at single time rates and six days per week. Day shift rates shall apply for the first two shifts and night rates to the second two shifts. No member of the union, excepting the foreman, shall work over six hours at any time during the 24-hour day.
8. That the existing contract provisions shall determine the rate for foreman with this supplemental provision. that if be works Saturday afternoon he shall be paid for this additional four hours of time at his minimum regular hourly rate based on forty-four hours.
9. Should a plant decide to operate on a minimum two 6-hour shift basis as hereinbefore described, compensation of the foreman shall be arrived at by the foreman and the plant; provided, that the foreman shall not receive a scale less than the minimum based upon the provisions of the existing contract.
10. Sub rates as provided for under the existing contract shall be eliminated.
11. That two presses over 42 inches may be operated with one pressman, with one Senior and one Junior feeder.
12. That a Seven (7%) per cent reduction be made on the existing basic contract wage scale for all pressmen, press assistants, cylinder and job press feeders; that said reduction is not to be regarded as a permanent change in the prevailing basic rate, but is representative of a voluntary reduction to meet existing emergencies in which the industry is involved and is to continue for a period of three (3) months, at which time the representatives selected by the parties to the agreement shall meet for the purpose of making such revisals as may be required, looking to the restoration of all or part of the decrease stipulated, the extension of it or a further revisal, all of which is to be calculated by the conditions of business at that time as by comparison with the conditions of the business at the time of execution of this agreement. Further, the parties hereto agree that the Seven (7%) per cent reduction herein stipulated represents a minimum relief as measured by the existing conditions, but the equities involved do not justify a further reduction until there has been established a measure of uniformity in the distribution of the cost of necessary liquidation.

It is mutually agreed that the adjustments set forth in this Agreement shall apply only to those plants which cooperate in sliding their forces and absorbing their proportionate share of unemployed men.

It is mutually agreed and understood that all conditions of the existing contract between the aforesaid mentioned parties, except as modified by this Supplemental Agreement, shall remain in full force and effect subject to any further supplementary agreement through the same procedure followed in reaching this agreement.

It is further mutually agreed and understood that this Supplemental Agreement shall be in full force and effect the first fiscal day of the first full fiscal week following March 1, 1932.

GEO. L. BERRY
President, Int. Printing Pressmen and Assistants' Union of N. A.

M. F. HURLEY
Representing the Printers League Section, New York Employing Printers Association, Incorporated.

EXHIBIT 17. - AMENDMENTS TO THE SECOND SUPPLEMENTAL PRESSROOM AGREEMENT

Depression Adjustments, June 6, 1932

Mr. M. F. Hurley, for the Printers League, and Mr. Joseph C. Orr, representing President George L. Berry of the International Printing Pressmen and Assistants' Union of North America, met last week to consider revisions in the Supplemental Agreement to the pressroom contracts as provided in the agreement. After a week of negotiations, Mr. Hurley and Mr. Orr on Friday, June 3, 1932, signed a new agreement continuing the Supplemental Agreement for another three months with the following important changes:

1. The changes in supplemental agreement as listed below become effective the first day of the first fiscal week following June 7, 1932.

2. Members of the Pressmen and the Assistants' Union are limited to five days per week instead of four as provided in the old agreement.

3. The plant may operate six full days a week, at single time rates, provided no member of the unions, except the foreman, works more than five days. The provision for optional operation of 4 hours or 8 hours on Saturday continues. The rates for the Saturday night shift are the same as under the old Supplemental Agreement - first 4 hours at single price - second 4 hours at price and one-half, provided no man except the night foreman works more than five nights.

4. The six hour shift plan of operation is abolished entirely. All plants must operate on the 8-hour day and 8-hour night basis.

5. All single color flatbed cylinder presses over 42" up to and including 68" equipped with automatic feeding machines require a senior feeder on each press instead of one senior and one junior feeder to each two presses, as provided by the old agreement.

6. All basic wage scales have been modified as follows:

Cylinder pressmen - $55.00 for 44 hours
Job Pressmen - 47.00 for 44 hours
Cylinder Feeders - 43.00 for 44 hours
Job Press Feeders - 30.00 for 44 hours

Since no members of the unions except foremen may work more than 40 hours, a man's weekly scale is determined by multiplying the hours worked during the fiscal week by the new hour rate. A wage scale booklet giving the new hour rates is being printed and will be mailed to you on Wednesday for the guidance of your bookkeeping department.

7. The overtime provisions of the basic contracts remain in effect. If any questions arise in the application of this new agreement, please get in touch with the League office.

Very truly yours,

F. A. Silcox
Secretary
Printers League Section
N.Y. Employing Printers Assn., Inc.

EXHIBIT 18.- COVERING LETTER OF THE NEW YORK PRINTERS' LEAGUE SECTION OF THE NEW YORK EMPLOYING PRINTERS' ASSOCIATION TO PRESIDENT BERRY OF THE INTERNATIONAL PRINTING PRESSMEN AND ASSISTANTS' UNION OF NORTH AMERICA.

August 1, 1931
(Mailed Aug. 7, 1931)

Major George L. Berry, President
International Printing Pressmen & Assistants' Union of North America
Pressmen's Home, Tennessee

Dear Major Berry:

The discussion at the joint meeting of representatives of the League and the local pressroom unions must have re-emphasized to you the serious character of the situation in New York City about which you are to a large extent familiar. A situation which, already cumulatively serious in its effects on union plants in New York City, has been tremendously accented by the depression and the ruthless cut-throat competitive conditions which now exist. The loss of work by union plants in New York City has vitally affected both employees and employers. A larger proportion of the membership of both No. 51 and No. 23 has been out of work than in any previous depression the industry has ever experienced. It is a situation which challenges the leadership of both the unions and the employers to seriously consider possible remedies. There are two choices for the union employing printers of New York City; either to produce their printing product at unit costs which will make it possible to compete with the non-union plants both in and outside of New York City or else reduce wages. Bound by contract the employers must continue to pay the existing wage scales or else move away and join the increasing number of successfully operated non-union plants. It is time for plain talking. Faced with the constant under-bidding of 25 to 30 per cent from the non-union plants our plants are seriously threatened in maintaining a healthy financial condition. In the interest of everyone concerned the best cooperative efforts of the League and the Unions must be applied to make possible low unit costs so that present standards of wages and hours can be maintained. It is only by reducing unit costs that employment of members of No. 51 and No. 23 can be assured. Without touching the wage scales it is definitely possible to reduce unit costs in the pressroom by reducing the complement of press assistants now required on automatically equipped presses.

Supplemental to the present existing contract an agreement was made to make a survey of the pressrooms in New York City and after six months to hold a joint conference to determine what action it was advisable to take to modify the contract. Copy of the agreement is included in the appendix of the attached brief.[1]

The League has done its part in actually making this survey - the results of which will, I'm sure, be as surprising to you as they have been to us here in New York City. A summary of the results of the survey is contained in the attached report in which is offered the basis of a policy covering immediate and future action.

So far as I am able to determine no policy has anywhere yet been outlined to meet this problem. Something has to be done and soon to establish a sound constructive policy which will give our union plants an opportunity to produce both in quantity and quality at lower unit costs to insure more employment through not only keeping the work they now have but in getting more work. The only other solutions are to move out of New York City, go open shop, or reduce wages.

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[1] Here presented in appendix exhibit 15.

Here is an opportunity for leadership which will avoid such alternatives and make effective a constructive program. We have confidence in your courage, your foresight and deep interest in the welfare of the industry as a whole and of the members of your organization in particular to meet this problem constructively.

The attached summary brief which states the facts of the situation and submits proposals is being sent directly to you in accordance with the understanding reached at our conference. It was agreed, as we understand it, that you would take the matter up with Nos. 51 and 23 and later with representatives of the League in joint conference with the representatives of both locals.

The League desires that at the earliest practicable date arrangements be made for you to come to New York City and go over in joint conference with the League and Nos. 51 and 23 specifically and in detail the proposals as set forth in the attached brief.

Sincerely yours,

(signed)
F. A. Silcox, Secretary,
Printers' League Section
New York Employing Printers Association, Inc.

EXHIBIT 19. - RÉSUMÉ OF THE PRESSROOM SURVEY OF THE PRINTERS' LEAGUE

Union printing establishments of New York City face two major competitive groups:

(1) Non-union printers in New York City
(2) Out-of-town printers

There is but one way in which this competition can be met and that is by maintaining unit costs sufficiently low for work produced in union shops to enable them to compete with the non-union printers in New York City and with the out-of-town printers who now underbid by 25 to 30 per cent.

The pressroom unions are as vitally interested in this competitive situation as the union employing printers. Unless the flow of work into non-union and out-of-town plants can be stopped, not only are jobs endangered but the very existence of the unions themselves is threatened.

Purely from the standpoint of enlightened self-interest, then, the pressroom unions should join with the fair employers in the establishment of pressroom conditions which will permit:

(1) Retention of work in union shops and continuance of present jobs for the union men
(2) Union organization of non-union shops thereby increasing available jobs for union men

For the facts are, that the pressrooms of New York City are overwhelmingly non-union. This is clearly shown by the comprehensive survey of pressroom equipment in Greater New York which has just been completed by the Printers League and which is introduced in the appendix of this brief.[1]

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[1] It seemed unnecessary to include these detailed tables in this appendix. They are on file at the Printers' League Section of the New York Employing Printers' Association and can be consulted there.

The survey discloses the staggering fact that of 2624 plants in Greater New York, 2381 or 91 per cent operate non-union pressrooms, and of 13,032 presses in New York printing plants, 10,194 or 78 per cent are in non-union pressrooms.

The reasons for this startling condition, of course, are to be found in the introduction of high speed, automatic presses and the insistence by the unions that these presses shall carry an overload of men who are not needed and who, in fact, are not employed under non-union conditions. The extent of mechanization of the pressroom is too well known to need much elaboration, but the following table reëmphasizes the point most effectively. It shows the sale of cylinder presses in New York City by all principal press manufacturers for each year from 1913 to 1928 and indicates for each year the percentage hand and mechanically fed.

SUMMARY CUMULATIVE TABLE
SALE OF CYLINDER PRESSES - NEW YORK CITY[a]

Year	Hand-Fed Cylinders		Mechanically-Fed Cylinders	
	Number	Per cent	Number	Per cent
1913	135	75	45	25
1914	277	76.3	86	23.7
1915	357	70.3	151	29.7
1916	463	67.4	224	32.6
1917	555	60.7	360	39.3
1918	576	55.0	474	45.0
1919	583	48.6	617	51.4
1920	584	40.7	851	59.3
1921	572	35.9	1023	64.1
1922	621	33.0	1261	67.0
1923	619	28.5	1556	71.5
1924	645	25.3	1903	74.7
1925	666	21.9	2375	78.1
1926	675	19.2	2848	80.8
1927	679	17.2	3280	82.8
1928	675	15.2	3754	84.8

[a] These data were given to the Printers' League of the New York Employing Printers' Association by the author of this monograph.

In other words, the hand fed press is almost obsolete and yet the union requirements for manning the improved mechanically fed presses are practically unchanged since the days of hand feeding.

The records for one of the earliest and most widely used job automatic cylinder presses illustrate the effect of union requirements on press operation in New York City. In October, 1924, there were 53 of these presses in union shops and 43 in non-union shops. In other words, in this eight year period, while the number of this type of press in union shops increased approximately 400 per cent, the number in non-union shops increased 1200 per cent.[b]

Further examination of the tables in the appendix reveals other important facts relative to union pressroom restrictions. Work that can be done under non-union conditions without danger of loss from union action is largely done now in non-union plants and the unions have lost control over the groups of printers doing this type of work. This type of work has steadily increased in New York City over the past 15 years but the increase has come in non-union shops. Work such as periodical printing, over which the union still exercises a degree of control because of the necessity of maintaining production schedules, has steadily been driven out of New York.

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[b] The text discussion, Pages 101-2, should be consulted here regarding the care which is necessary in interpreting figures of this kind.

The loss of periodical printing in New York is well known.

In the past eight years, the printing of over 200,000,000 copies annually of magazines has been taken out of New York.

Entire plants, all large volume printers, have moved out:

Colliers to Springfield	non-union
McCalls to Dayton	non-union
Carey Printing Company to Greenwich	non-union
Art Color Printing Company to Dunellen	union
Williams to Albany	union
American Colortype Company to Allwood, New Jersey	non-union
Federal Printing Company to Philadelphia	in part non-union
Harpers to Camden	non-union
Methodist Book Concern to Dobbs Ferry	union

In 1920, New York had 170 magazine web presses. Today it has 68, less than one-half. Edward Langer Printing Company, with 10 of these remaining magazine webs is also on its way out of the jurisdiction of the local New York unions to Dunellen, New Jersey.

Obviously, without further elaboration, printing under union conditions in New York City is seriously jeopardized unless the unions join the fair employers in a constructive program to meet non-union and out of town competition.

The Printers League, therefore, is presenting herewith for union consideration its program for remedying and maintaining union conditions in New York City.

The Program proposed is in two parts:

(1) A five-year plan to meet the changing pressroom conditions.
(2) Proposals for immediate relief in order to meet present conditions.

EXHIBIT 20. - FIVE-YEAR PLAN FOR REORGANIZATION OF PRESSROOMS IN NEW YORK CITY

The five-year plan which will care equitably for present members of the pressroom unions and will permit economical operation of the presses is as follows:

1. Recognize and extend, as far as practicable, the option of:
    a) The one-pressman-to-the-press unit plan of operation on all automatically equipped presses over 36 inches, or
    b) The operation of two automatically equipped presses over 36 inches with one pressman and one senior feeder.
2. Transfer the loading up of paper on presses to Paper Handlers.
3. With increased number of positions for pressmen, due to
    a) One-man-to-the-press operation, and
    b) Enforcement of uniform conditions in plants, Pressmen's Union No. 51 to assist in taking care of press assistants displaced.

4. Pressmen's Union No. 51 to take in through special examination arranged for at the School for Printing Pressmen, such members of Press Assistants' Union No. 23 as can qualify as pressmen or make allowance for apprentice standing based upon experience and training.

5. Press Assistants' Union No. 23 not to take in any more members and work now performed by apprentice feeders to be done by unclassified helpers.

6. Transfer such members of Press Assistants' Union No. 23 to Paper Handlers and Sheet Straighteners' Union No. 1 who cannot qualify as pressmen or as apprentice job cylinder or cylinder apprentices.

7. Eventually all members of Press Assistants' Union No. 23 to be absorbed by either No. 51 or No. 1.

8. Establish direct system of apprenticeship in pressmen's union with age limits 17 to 22 and with educational qualifications of at least 8th grade grammar school.

Such a policy as above, if gradually worked out in the industry, would have the following advantages:

1. More skilled men and less machine-tenders.

2. Maintenance of wage and production standards.

3. Absorption with minimum unemployment of men displaced.

4. Further organization of plants now operating non-union or with non-union feeders.

5. Economies of operation to keep work in New York City and yet maintain standards of wages and hours.

6. Less blind-alley jobs.

7. A direct system of apprenticeship as now effective in the composing room.

8. Eventual elimination of conflict of interests between pressmen and press assistants.

9. Better opportunity for extension of educational work in the industry.

10. Greater stabilization under changing conditions.

EXHIBIT 21. - PROGRAM FOR IMMEDIATE REORGANIZATION OF PRESSROOMS IN NEW YORK CITY

In addition to the adoption of the foregoing five-year plan the Printers League proposes the following for immediate relief:

1. The operation of two small automatic job cylinder presses up to and including 22 inches [job automatics] with one pressman. Where helpers are needed, to be boys like runners in the monotype department - not members of the union and at wage scales optional with the employer.

2. The operation of two automatic presses over 22 inches up to and including 36 inches - one pressman and one junior feeder.

3. Operation of single color automatic presses over 36 inches of any size with one pressman and option of.

4. Operation of two automatically equipped single color presses over 36 inches with one pressman and one senior assistant.

5. Operation of automatic two-color presses up to and including 42 inches with one pressman.

6. Operation of all Perfector presses and automatic two-color presses over 42 inches with a pressman to each press and one senior feeder to each two presses.

7. Complement of feeders on rotary presses to be determined through joint study of operation and by mutual agreement.

The above proposals are the result of careful and considered study on the part of the Printers League. It is the sincere belief of the League that the adoption of these proposals will greatly help to restore union printing in New York City and will react definitely to the benefit of the pressroom unions. With "union-management cooperation" the watchword of industry today, the present situation presents a challenge to leaders on both sides. Can unions and employers cooperate in a long-time constructive program which will work a maximum of benefit to all concerned or will the situation be allowed to drift until the union employers are driven by necessity to force relief?

Obviously, these proposals affect the press assistants' union most seriously, since theirs is the craft being supplanted by the advent of automatic presses. It is a fact, however, that if these proposals are put into effect there should be an increase in job opportunities for the present press assistants:

1. As a result of the more reasonable shop rules proposed, it should be possible to organize a considerable proportion of the 2381 non-union pressrooms in the city which will never be organized if the present uneconomical restrictions are maintained. If one-fifth of these shops are organized within three years and only one job to a shop is gained for the assistants, it will mean that 400 to 500 assistants will be absorbed or between 133 to 166 jobs per year. It is incomprehensible to the League why the unions themselves have not grasped this point long ago and utilized it as a means of serving their own members.

2. Forty-five apprentices a year are now taken by the pressmen's union from the ranks of the assistants' union.

3. Extension of one pressman to the press operation will permit the absorption into the pressmen's union of such assistants as are qualified. Considering the new presses purchased annually by New York City printers, considering the possible extended organization of non-union plants, and taking account of the natural expansion of the industry permitted by economical press operation, it is probable that 150 additional pressmen jobs annually for the next five years will be created as a result of this method of operation.

4. Thus there is an estimated total annual absorption of between 328 and 361 feeders per year, which will absorb practically all of the men who will be affected by the modified rules.

It is the considered judgment of the Printers League that more pressmen and assistants will be employed if its proposals are put into effect than is and will be the case under the present restrictions.

The pressroom unions can make one of three responses to the proposals contained herein:

1. They can endorse the League's suggestions and join cooperatively in a long-time constructive program.

2. They can submit counter proposals to remedy the obvious situation which exists.

3. They can sit tight and refuse to participate in any cooperative efforts forcing the employers to take such action as the exigencies of the situation later may require.

The League, therefore, respectfully requests that the unions' answer be made specific and clear as to which course of action will be followed. Pending formulation of an answer, in order to hold in union shops of New York work that is now seriously endangered by outside competitive groups, particularly periodicals, the League suggests the immediate appointment of a commission on which will be the Joint Conference Committee representatives of the pressmen's union, the assistants' union and the League, with some representative of the International Printing Pressmen and Assistants' Union of North America sitting in. Provision should be made in the meantime for any fair employer who by reducing pressroom costs can hold a job that would otherwise go to non-union or out-of-town competitors, to present his facts and figures to the commission together with the relief in complement of men and shop rules which is desired. If, in the judgment of the commission, the relief requested makes no unfair demands on the men employed, and if the job can be saved by such action, temporary relief as requested shall be granted for the specific job.

New York, New York.
August 5, 1931

APPENDIX C

RESEARCH NOTES

NOTE 1.—COLLECTING DATA ON MACHINE INSTALLATIONS

The problems encountered in the collection of data on machine installations rose from the following sources: (1) the confidential nature of the material requested; (2) the lack of uniformity with which records are kept; (3) the detailed nature of the information desired.

The Confidential Nature of the Material Requested

The conversion of manufacturers of press machinery to the cause of this investigation enough to induce them to submit complete and specific sales' records of their machines for sixteen years was one of the first and most delicate tasks undertaken. No letters of introduction were used. Direct appeal was made to one or more executives of each company, sketching the aim and procedure of the study, with emphasis in each case upon those phases which it was thought would be of most interest.

The suggestion that an inquiry of the kind proposed was of value to machine manufacturers because of workers' increasing fear of displacement and their consequent hostility to new machinery was probably the most effective argument offered. The point was made that "technological unemployment" is a phrase too loosely used, that we know little about it scientifically, and that definite information is necessary before anyone can deal with it effectively.

The fact that the data submitted were to be kept in private files to be used under the personal direction of an impartial investigator, and that the project was being financed by a group organized for scientific research, carried important weight. Some executives recalled with a degree of bitterness former experience in which they had given out confidential material which they expected to be treated impartially, but which had either not been sufficiently protected, or had been used in making false conclusions.

The single refusal of sales' records which was finally sent by the largest of the three manufacturers of magazine-rotary presses made it impossible to use the data received from the other two companies. Every attempt to use these data to show trends in the labor-saving qualities of magazine-rotary presses proved to be inadequate and therefore misleading, or else too revealing of the confidential business of these companies.

The Lack of Uniformity with Which Records Are Kept

For the reason that records are not kept uniformly by manufacturing companies, and that identical terms may designate different items, one cannot be too explicit in setting down what one means when asking for data. An example of failure to be sufficiently explicit in this inquiry may be of help to others.

The heading of the schedule submitted to the company was as follows: "— —machine installations by specified geographical divisions and by size classifications from 1913 to 1928 inclusive." It was explained that by "installations" was meant domestic sales during the time and in the geographical areas stated—"New York City," "Chicago (city)," and "the rest of the United States."

After five days of copying off the records by a clerk of this company which completed the tabulations for New York and Chicago, the figures were examined and found useless. The term "installation," the meaning of which had seemed clear, was found to have been given a very different interpretation by the company from that intended on the schedule. As a consequence, the records were being taken from what the company called its "live files." Here were recorded only those machines that were still in use. So far as was known, no machines that had been installed and later discarded were shown in this file except when they had been rebuilt and reinstalled. Selective records of this sort might have been used, of course, had they been obtainable in complete form from this firm and from all the other manufacturers. Even this company could not be certain of full accurate records. No systematic effort was made to discover cases in which its machines were rebuilt and reinstalled by others, but whenever the firm knew of such cases of rebuilding by others the records were shown on the "live files." Furthermore, these live files showed only the current location of the machines, whenever this was known, instead of the city in which the machines were originally installed. For example, a machine first installed in New York City and later transferred to Dayton, Ohio appeared for this study not in the list for New York City but in the list for "the rest of the United States."[1]

The transcriptions from the live files of this firm, therefore, were highly misleading for the purposes of this analysis. They failed to show not only "total installations" or "total sales" but also the "geographical divisions" in which these sales were originally made. The executive of the company who had directed the work thought the error would be about ten per cent. Starting all over again, the "permanent file" was successfully used. Here, every sale and installation of a machine by this company was recorded by a serial number, together with the place of its original installation.

Another cause of anxiety in collecting these data was that the sales' records of the other contributing companies might include those machines which had been taken in trade and rebuilt. Fortunately it was discovered that few companies accept old machines in part payment for new, and when they do so they resell them to second-hand dealers rather than to printers. "Presses taken in trade are a thorn in the flesh of all manufacturers," the president of one company explained. Nevertheless, after all sales' records had been submitted for this study, it was discovered that the records of one of the lesser platen-press manufacturers did reflect the practice of accepting old presses in trade which the firm rebuilt and resold. It was found, however, that the task of subtracting these figures from the company's total would have been out of proportion to the advantage gained because of the relative unimportance of the total when combined with the sales of the larger companies. Consequently, it was decided to let the reports of this firm stand as submitted.

These and other similar experiences in the process of collecting sales' data emphasized the importance of meticulous care in making known at the outset the exact nature of the data desired. Wherever it was possible to have a joint conference with the representative of the firm and the person in direct charge of the files who was to superintend the copying of the figures, the danger of misunderstanding was practically eliminated.

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[1] Even this phrase was misunderstood by one firm which directed its clerk to copy off the figures by each state separately instead for the country as a whole exclusive of New York City and Chicago.

The Detailed Nature of the Information Desired

Detailed information was so vital to the main theme of this investigation that no task was too great to secure it if the study was to be continued. The specific size-classifications under which machine sales were to be tabulated were absolute for two reasons: (1) because they must coincide with the sizes designated in the collective bargains between employers and unions; (2) because sales of mechanical feeders were to be combined with sales of presses in order to trace the changes from hand to automatic feeding. This requirement was particularly onerous for the five makers of flat-bed cylinder presses because of the 6 size-groups into which their many sizes of machines were to fall. One company could compile these figures only by going back into the shipping records—a long and tedious task, cheerfully executed.

The collection of sales' records for the three geographical divisions offered permanent trouble only for the platen presses, but for those it finally had to be abandoned. This was because the largest manufacturer of such presses sells almost exclusively to dealers who with their sub-dealers number into the hundreds. Aside from the fact that no one knew the names of all these dealers and sub-dealers, not even the largest of them kept full records of their own sales of presses. One of them explained that "these presses are sold like hammers in hardware stores, and it's impossible to keep the records." Moreover, where records had been kept they included areas so large that they offered no basis for estimating sales for the areas here required.

Consequently, platen-press sales could not be used for making comparisons between New York and Chicago, but only for tracing the growth of mechanization in the United States as a whole. Even for this purpose great care was necessary in combining the data from the several companies for the reason that the largest manufacturer not only sells to dealers but to makers of automatic feeders who in turn sell the combined presses and feeders as units under their own trade names.

Note 2.—Measuring Productivity

In the absence of a satisfactory unit of production applicable to all commercial printing, it was at first hoped that representative plants could be so selected that each could be listed in one of four groupings according to the nature of its product, and that a simple unit of production such as the number of impressions per hour could then be adopted for each group. In this limited way changes in productivity could then have been compared with changes in the number of men employed and a unit of displacement computed. The four tentative classifications of product were: (1) cheap work, (2) medium high-grade work, (3) high-grade work, (4) *de luxe* work. But these groupings proved to be useless. The products of only a few firms were sufficiently uniform to be grouped under a single descriptive heading. Orders received in most plants are highly diverse and competition is so strong that they are not likely to be refused if it is possible to execute them. Clearly, the results from this plan would have been specious.

For the measurement of changing press *capacity*, which is discussed in the text, the tabulation of press equipment from the schedules required more interpretation and adjusting than was anticipated. Although the schedule called for bed-size of presses (the capacity measurement), the sheet-size was sometimes inadvertently given by the pressmen who usually think of press sizes in terms of the dimensions of the sheets which they print. The sheet, of course, may or may not use the bed to its fullest capacity. In tabulating from the schedules, therefore, constant reference was made to company catalogues of presses which usually give both sheet and bed sizes. So much care was taken with these tabulations that the result is believed to be a conservative basis for computing changing printing capacity. In the computations no notice was taken at any time of the frequent cases in which capacity had been increased one-half inch by the trimming of bearers.

The units of impressional strength used in calculating printing capacity were taken from *The Standard Book on Estimating for Printers* prepared by Fred W. Hoch for the "Management Series" of the United Typothetae of America (pages 142-55). Here are grouped presses of similar style and size together with their output in average number of impressions per hour for each of five different classes of work: A, B, C, D, and E. Mr. Hoch explains that the speed with which each of these five different classes of work can be printed depends upon five salient factors that govern press running, viz: (1) the nature of the form; (2) the kind of paper stock used; (3) the class of work desired; (4) the size of the form; (5) the size of the press on which it is to be run. For example, according to Hoch's estimate, the smallest hand-fed platen presses average 1,340 impressions per hour on Class A work, 1,180 on Class B work, 1,050 on Class C work, 1,000 on Class D work, and 835 on Class E work. When these presses are mechanically fed their impressions per hour for the different classes of work respectively are 1,665, 1,430, 1,250, 1,175 and 1,000. A machine-fed press turns out about 20 per cent more impressions than when it is hand-fed.

For the present study the arithmetic average of these five average rates of speed was adopted as a basis for computing square-inch printing capacity in each group of presses. In brief, the standard used was that which represents the average number of impressions on medium-grade work for each press group. This figure (1,081 in the smallest hand-fed-platen group) was always very near the average for Class C work.

Three points may be raised in question of the reliability of the square-inch-capacity index used in this study:

(1) Many printers hold that Hoch's standard averages of impressional strength are too low. The author has herself witnessed the daily operation of presses sending printed sheets out over the gas flame to the delivery at a considerably greater rate than that given as standard. For example, 25x38 inch sheets were coming from a certain hand-fed press of that size at the rate of 1,500 an hour, where the standard maximum for a press in this group is 1,110 impressions, and the average (adopted for this study) is 915 impressions.

Nevertheless, the standard estimates are consistent as well as conservative, to say the least, and, as they are used throughout this study, their conservatism in no way impairs the comparability of productivity figures at different periods.

(2) The relation of the *actual* to the *capacity* use of the printing cylinders may well have changed during the years for which square-inch printing capacity was measured—either because of idleness of presses or because of the running of larger or smaller sheets in one period as compared with another.

(3) In measuring changing printing capacity from year to year, the fact that press sales were not requested by exact sizes of presses but by press groups necessitated the establishment of units of measurement in which there is bound to be some error. Actual sheet capacity could not be calculated for these presses. This was only possible for the 700 or so presses included in the five-year survey of New York City plants where exact sizes were recorded. The printing capacity of presses found in the thirty-six plants for 1923-1924, therefore, was taken as a unit of measurement. The year 1923-1924 was chosen rather than 1928-1929 because it was nearer to 1913, the first of the sixteen years for which total sales of presses for the country were secured. That is to say, single abstract figures designating the average square-inch printing capacity per hour for hand-fed and for machine-fed presses for each press group (platens, job-automatics, small cylinders, and large cylinders) were taken as units for calculating changing printing capacity in these groups. The procedure was then simple, the unit figures being multiplied in each case by the number of presses sold each year.

The units for the two-color and perfecting presses had to be calculated a little differently. The small number of these presses found in the 36 New York plants in 1924 made too narrow a base for computing average square-inch capacity. Therefore the capacity of these presses found in the 9 large plants in 1923-1924 was added to that for the 36 plants and the sum weighted by the total number of these presses in the 45 plants. This formed a representative unit of measurement more nearly comparable with that for the other four groups.

The productivity units finally adopted and the number of presses represented in their weighting were as follows:

Press Group	*Number of Presses*		*Average Hourly Square-Inch Printing Capacity (000's)*
Platens	Hand-fed	101	172.6
	Machine-fed	44	212.4
Job-automatics	Machine-fed	57	748.6
Small cylinders	Hand-fed	32	964.1
	Machine-fed	12	1,260.4
Large cylinders	Hand-fed	74	1,748.8
	Machine-fed	34	2,226.6
Two-color and perfecting cylinders	Hand-fed	6	3,724.1
	Machine-fed	35	4,744.4

For the pre-1913 press capacity it was necessary to adopt different methods of calculation for the cylinders. For the platens the same average figures could be used as for the sixteen-year period beginning with 1913, just explained. In the case of the cylinders the job-automatics formed so important a part in the 1923-1924 figure that it could not be used for the time before 1913 when there were no job-automatics. Consequently the sales of cylinder presses by groups for the first five years of the sixteen-year average (1913-1917), exclusive of job-automatics, were taken as a basis for weighting the composite figures for all cylinder presses, hand-fed and machine-fed always taken separately. The total hourly square-inch capacity for these years was then divided by the total number of presses. The resulting two figures were the units by which total pre-1913 sales were multiplied to obtain their printing capacity. The weights and the unit figures were:

	Number of Presses	*Average Hourly Square-Inch Printing Capacity (000's)*
Hand-fed	2,844	1,610.2
Machine-fed	1,423	2,493.3

This was probably a liberal base for calculating pre-1913 press capacity, principally because of the two-color and perfecting presses which were relatively scarce in those years but which were given their 1923-1924 weight. The fact that the capacity of these presses is twice that of the single cylinders means that we have probably overestimated the total capacity of the pre-1913 period. This precaution is especially pertinent in the interpretation of Table II of the text.

The general reservation which should be made concerning the reliability of all computations of changing press capacity included in this study (except that for the five-year period, 1924-1929) is that the particular constellations of presses that existed in 1923-1924 from which the productivity units were computed are too static to be completely representative of the changing composition of total presses sold each year. Within the totals for hand-fed and machine-fed press sales the proportions of the whole for each press group were, of course, changed. With the data that could be obtained no allowance could be made for these changing proportions.

In the computation of printing capacity of rotary presses, except for the few which were found in the New York shops included in the survey for which average impressional strength could be obtained directly, the following formula was used:

(1) The average speed of paper through the press was taken to be approximately:

Date	*Feet per Minute*
Before 1910	325
1910-1920	400
1920 to the present	450

(2) The width (in feet) of the paper roll multiplied by this speed and by 2 for each roll equals the surface in square feet printed per minute. The result x 60 equals the printed area per hour per roll. This result x the number of rolls equals the total per press. For example: For a recently built single-roll press five feet wide, multiply 5 by 450 and by 2. This equals the printed area—4,500 square feet per minute. Multiply the result by 60 for the square feet per hour (270,000). For a two-deck press (2 rolls) the square feet per hour would be 540,000.

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[1] Heavy draft has also been made upon unpublished documents which are on file with the Printers' League Section of the New York Employing Printers' Association. This material is in the form of briefs of employers and of unions in arbitration proceedings, memoranda, minutes of executive meetings, reports, charts, agreements. *The American Pressman*, monthly journal of the International Printing Pressmen and Press Assistants' Union of North America, published by Pressmen's Home, Tennessee, was also a frequent source of information.

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COLUMBIA UNIVERSITY PRESS
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New York

FOREIGN AGENT
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Humphrey Milford
Amen House, London, E. C.